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**National Highway
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Bloomington, Indiana 47403-1599

ON-SITE SCHOOL BUS INVESTIGATION

CASE NO. - 95-22
FLEET - CORPORATE SCHOOL BUS
LOCATION -
ACCIDENT DATE - 1995

Submitted By:

Research Scientist
and

Associate Scientist

1996

Revised Submission:

1996

Contract Number: DTNH22-94-D-17058

Prepared for:

U.S. Department of Transportation
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The crash investigation process is an inexact science which requires that physical evidence such as skid marks, vehicular damage measurements, and occupant contact points be coupled with the investigator's expert knowledge and experience of vehicle dynamics and occupant kinematics in order to determine the pre-crash, crash, and post-crash movements of involved vehicles and occupants.

Because each crash is a unique sequence of events, generalized conclusions cannot be made concerning the crashworthiness performance of the involved vehicle(s) or their safety systems.

NOTE

The investigation contained in this report follows the test cylinder placement protocol as presented within the Final Rule for Federal Motor Vehicle Safety Standard, Number 111, Rearview Mirrors (Convex Cross View Mirrors on School Buses) published (Docket No. 89-26; Notice 3) in the Federal Register / Vol. 57, No. 232 / Wednesday, December 2, 1992 / Rules and Regulations, pages 57000-57020. The Final Rule is presented in **APPENDIX A** of this report.

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12. Sponsoring Agency Name and Address U.S. Department of Transportation (NRD-32) National Highway Traffic Safety Administration National Center for Statistics and Analysis Washington, D.C. 20590		14. Sponsoring Agency Code	
15. Supplementary Notes On-site School Bus investigation involving a 1981 Ford B700, Type C, 64-Passenger, Conventional Body (body by School Bus and a Pedestrian (prior occupant))			
16. Abstract This report covers an on-site investigation of a school bus incident that involved a 1981 Ford B700, Type C, 64-Passenger, Conventional Body (body by School Bus and a pedestrian. The school bus (case vehicle) was stopped, heading west, on a two-lane, undivided, state road to unload two passengers. A male student exited the case vehicle and, taking a north-to-south path, successfully passed in front of it and crossed both travel lanes. Next, a female student exited the case vehicle and began to cross, north-to-south, in front of it. The pedestrian's mother, who was watching from her home on the south side of the roadway, observed her daughter walking southward "near the bumper". Two noncontact vehicles were stopped in the eastbound lane of the same roadway and were waiting for the case vehicle to finish unloading before continuing on their way. The driver of the first noncontact vehicle was not looking eastward just prior to impact. Both the passenger in the first noncontact vehicle and the driver of the second noncontact vehicle observed the child pedestrian crossing the roadway north to south. The driver of the second noncontact vehicle indicated that the child had stooped over to pick up something she had dropped on the roadway just prior to the impact. There is no indication that the driver of the case vehicle ever saw the child pedestrian, and the case vehicle accelerated before the student had cleared the vehicle's front. The front left portion of the case vehicle's front bumper contacted her left side, knocking her to the pavement. According to the injuries identified in this child's autopsy, this contractor believes that the child was knocked to the pavement, on her back, with her head pointing almost due west, parallel with the roadway, and her right side nearest to the on-coming case vehicle. The case vehicle's left front tire, followed by the left rear dual tires, passed over, primarily, the right side of the child's torso and head. The case vehicle's driver (50 year-old female) was uninjured, but she was so distraught that she was transported by ambulance to a medical facility where she was treated and released. The child pedestrian (5 year-old female), and former bus passenger, was transported by ambulance to a medical facility where she was pronounced dead. According to the child's autopsy, she sustained fatal brain injuries which included: a right cerebral laceration; multiple, unspecified, cerebral contusions; a comminuted basilar skull fracture; a displaced right skull fracture; and a left skull fracture. Her trunk sustained bilateral lung contusions, multiple liver lacerations, and a complete transection to her urinary bladder.			
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TRC/IU ON-SITE SCHOOL BUS INVESTIGATION

TRC/IU CASE NO. 95-22

FLEET - CORPORATE SCHOOL BUS
LOCATION -

SUMMARY

This report concerns a motor vehicle incident involving a 1981 Ford B700, Type C, 64-Passenger, Conventional Body (body by _____ School Bus and a pedestrian (prior bus occupant) occurring in _____ 1995 at _____ in a county on a State road. This incident is of special interest because the school bus's convex cross view mirrors were improperly positioned and/or of insufficient size to adequately detect the presence of a child who, after departing the bus, was subsequently run over and fatally injured.

The school bus was stopped, heading west, on a two-lane, undivided, state road to unload two passengers. A male student exited the bus and, taking a north-to-south path, successfully passed in front of it and crossed both travel lanes. Next, a female student exited the bus and began to cross, north-to-south, in front of it. The pedestrian's mother, who was watching from her home on the south side of the roadway, observed her daughter walking southward "*near the bumper*". Two noncontact vehicles were stopped, heading east, in the eastbound lane of the same roadway and were waiting for the bus to finish unloading before continuing on their way. The driver of the first noncontact vehicle was not looking eastward just prior to impact. Both the passenger in the first noncontact vehicle and the driver of the second noncontact vehicle observed the child pedestrian crossing the roadway north to south. The driver of the second noncontact vehicle indicated that the child had stooped over to pick up something she had dropped on the roadway just prior to the impact. There is no indication that the driver of the school bus ever saw the child pedestrian, and the school bus accelerated before the student had cleared the bus's front.

The front left portion of the bus's front bumper contacted her left side, knocking her to the pavement. According to the injuries identified in this child's autopsy, this contractor believes that the child was knocked to the pavement, on her back, with her head pointing almost due west, parallel with the roadway (approximately 260 degrees), and her right side nearest to the on-coming case vehicle. The case vehicle's left front tire, followed by the left rear dual tires, passed over, primarily, the right side of the child's torso and head. CDC and TDC are out-of-scope for this incident; therefore, the CRASHPC reconstruction program was not used. However, this contractor's visually estimated Delta V, for the initial bumper impact, is less than 5 km.p.h. (3 m.p.h.).

The 1981 Ford B700, Type C, 64-Passenger, School Bus was equipped, at the driver's position only, with an active, two-point, lap belt. The school bus driver's (50 year-old female) restraint usage is unknown. She sustained no injuries but was so distraught that she was transported by ambulance to a medical facility where she was treated and released. The pedestrian (5 year-old female), and former bus passenger, was transported by ambulance to a medical facility where she was pronounced dead. According to the child's autopsy, she sustained fatal brain injuries which included: a right cerebral laceration; multiple, unspecified, cerebral contusions; a comminuted basilar skull fracture; a displaced right skull fracture; and a left skull fracture. Her trunk sustained bilateral lung contusions, multiple liver lacerations, and a complete transection to her urinary bladder. In addition, she sustained multiple contusions and abrasions.

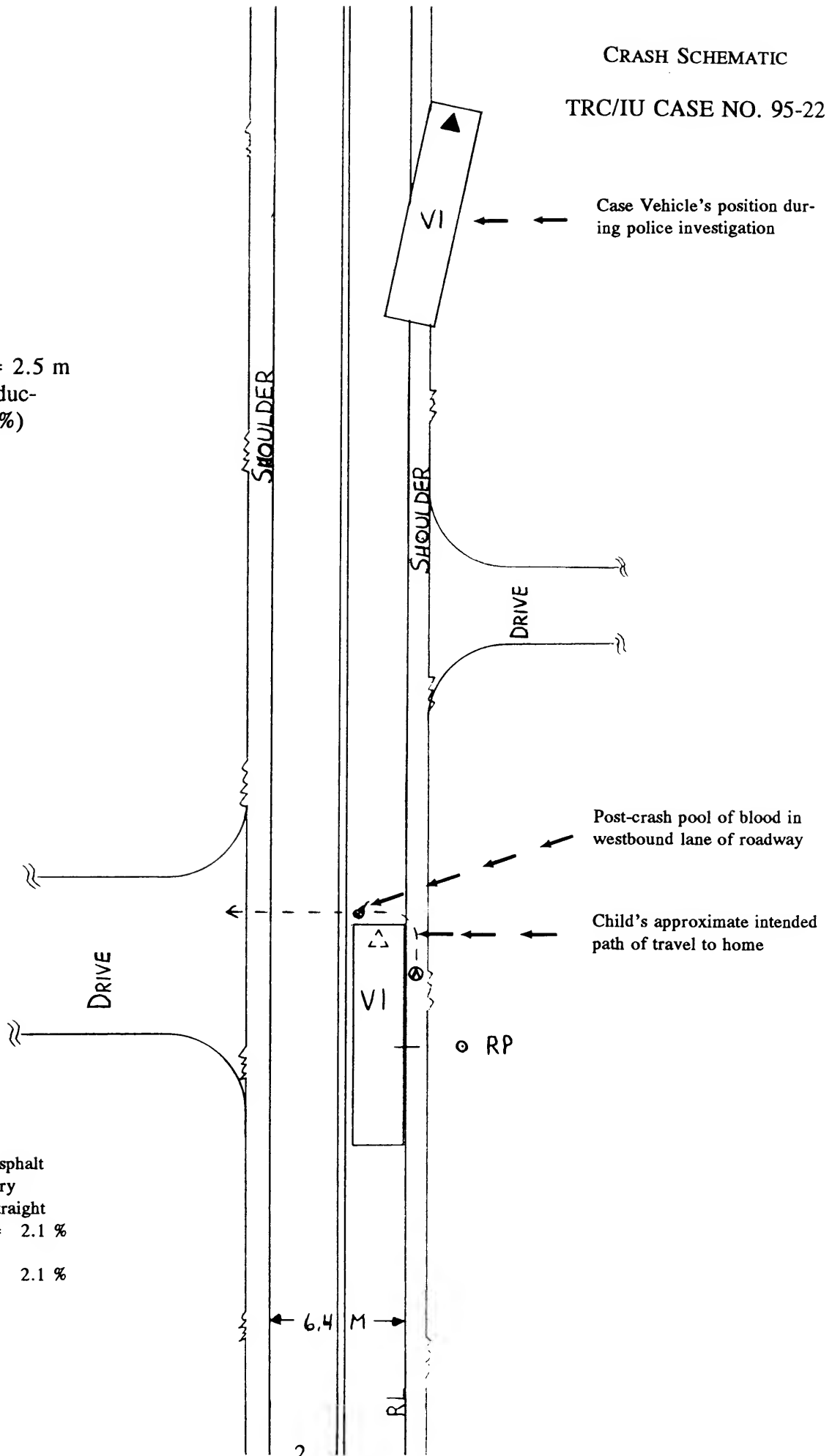
The field-of-view evaluation positions (Test Cylinders A through P) listed in the _____ on _____ 1992 are, in our opinion, the minimum field-of-view that should be available to a bus driver.

CRASH SCHEMATIC

TRC/IU CASE NO. 95-22



Scale: 1 cm = 2.5 m
(prior to reduction @ 96%)



Road Surface: Asphalt
Road Condition: Dry
Curvature: Straight
Slope, pre-impact = 2.1 %
positive to west
Slope, at impact = 2.1 %
positive to west

TRC/IU ON-SITE SCHOOL BUS INVESTIGATION

TRC/IU CASE NO. 95-22

FLEET - CORPORATE SCHOOL BUS
LOCATION -

ACCIDENT DATA

Location/Street:	State Road
State:	
Area/Type:	Rural, Agricultural
Accident Date/Time:	1995, @
Investigating Police Agency:	
Accident Type:	School Bus / Pedestrian - right angle
Occupant Injury Severity (air bag vehicle):	Comminuted basilar skull fracture (AIS-4)

AMBIENT CONDITIONS

Light Conditions:	Daylight
Weather Condition:	Cloudy
Precipitation:	None
Road Surface:	Dry
Temperature:	Lower <i>"teens"</i> per Sheriff's Incident Report

ROADWAY

Case Vehicle

Location:	State road
Number of Travel Lanes:	Two-lanes, undivided
Width:	3.2 meters (10.5 feet)
Surface Type:	Bituminous
Median:	None
Shoulders:	0.9 meters (3.0 feet), bituminous, north side 1.2 meters (4.0 feet), bituminous, south side

ROADWAY (CONTINUED)

Case Vehicle

Vertical alignment: 2.1 % grade, positive to west
Horizontal alignment: Straight
Estimated Coefficient of Friction: .80
Traffic Density: Moderate

TRAFFIC CONTROLS

Case Vehicle

Signals: None
Signs: None
Markings: Double solid yellow centerline and solid white edge lines on north and south road edges
Speed Limit: 89 km.p.h. (55 m.p.h.)

VEHICLES

Case Vehicle

Year: 1981
Make: Ford
Model: B700, bus chassis, incomplete vehicle
Body Type: Type C School bus, 64-passenger, body by Wayne-McFadden
V.I.N. 1FDWJ74N1BV-----
Color: Yellow with black lettering
Front Bumper Height: Bottom: 0.46 meters (1.5 feet--18 inches)
Top: 0.74 meters (2.4 feet--29 inches)
Mileage: 215,395 km (133,840 miles) @ time of inspection
Engine: 8.2 liters, V8, Detroit diesel
Transmission: Three-speed automatic, column mounted
Steering: Power-assisted

VEHICLES (CONTINUED)

Case Vehicle

Brakes:	Power-assisted air brakes, 4-wheel drum
Padding:	Seat backs and seat tops
Active Restraints:	2-point, manual, lap belt for driver's position only
Passive Restraints:	None
Defects:	None relevant to incident
Fleet:	school bus
Tow status:	Driven from scene to police impound lot

VEHICLE DAMAGE

EXTERIORCase Vehicle

Event number:	First
Object Struck:	Pedestrian
Damage location	
Damaged Plane:	Front
Vertical Location	
On Plane:	Bumper
Direct Begins:	Unknown
Length Direct:	Unknown
Field L:	Unknown
C ₁ :	No residual crush
C ₂ :	No residual crush
C ₃ :	No residual crush
C ₄ :	No residual crush
C ₅ :	No residual crush
C ₆ :	No residual crush
D:	Unknown
Maximum Crush:	No residual crush
Location:	Unknown
CDC or TDC:	Out-of-Scope
Damaged Components:	None
Event number:	Second
Object Struck:	Pedestrian

VEHICLE DAMAGE (CONTINUED)

EXTERIOR (Continued)**Case Vehicle**

Damage location

Damaged Plane:

Front

Vertical Location

On Plane:

Left front tire

Direct Begins:

No damage visible

Length Direct:

18 cm (7.0 in)--width of tire

Field L:

18 cm (7.0 in)--width of tire

C₁:

Not applicable

C₂:

Not applicable

C₃:

Not applicable

C₄:

Not applicable

C₅:

Not applicable

C₆:

Not applicable

D:

Not applicable

Maximum Crush:

Not applicable

Location:

Not applicable

CDC or TDC:

Out-of-Scope

Damaged Components:

None

Event number:

Third

Object Struck:

Pedestrian

Damage location

Damaged Plane:

Front

Vertical Location

On Plane:

Left rear dual tires

Direct Begins:

No damage visible

Length Direct:

18 cm (7.0 in)--width of each tire

Field L:

18 cm (7.0 in)--width of each tire

C₁:

Not applicable

C₂:

Not applicable

C₃:

Not applicable

C₄:

Not applicable

C₅:

Not applicable

C₆:

Not applicable

D:

Not applicable

Maximum Crush:

Not applicable

Location:

Not applicable

CDC or TDC:

Out-of-Scope

Damaged Components:

None

VEHICLE DAMAGE (CONTINUED)

INTERIOR**Case Vehicle**

Damaged Components:	No damage
Other Evidence of	
Occupant Contact:	None
Manual Restraint	
System Failures:	None
Seat Performance	
Failures:	None

REPAIR

Cost Estimate:	No damage
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VEHICLE VELOCITY ESTIMATES¹**Highest Delta "V"****Case Vehicle**

Reconstruction Program:	Out-of-Scope
Program Algorithm:	Not applicable
Travel Speed ¹ :	< 5 km.p.h. (< 3 m.p.h.)
Total Delta "V":	Not applicable
Longitudinal Delta "V":	Not applicable
Lateral Delta "V":	Not applicable

COLLISION SEQUENCE

PRE-CRASH: According to the police investigation, the case vehicle (school bus) was stopped, heading west, in the westbound lane of a two-lane, undivided, state road to unload two passengers. A male student exited the bus and, taking a north-to-south path, successfully passed in front of it and crossed both travel lanes. Next, the second student, a five year-old female, exited the bus and began to cross, north-to-south, in front of it. According to the police investigation, the pedestrian's mother was watching from her home on the south side of the roadway and observed her daughter walking southward "*near the bumper*". According to the police investigation, two noncontact vehicles were stopped, heading east, in the eastbound lane of the same roadway and were waiting for the case vehicle to finish unloading before continuing on their way. The driver of the first² noncontact vehicle was not looking eastward just prior to impact. Both the passenger

¹ Case vehicle was accelerating from a stopped position.

² "First" means the noncontact vehicle closest to the case vehicle heading east in the eastbound lane. "Second" means the eastward facing noncontact vehicle behind the "first" noncontact vehicle.

COLLISION SEQUENCE (CONTINUED)

PRE-CRASH: (Continued)

in the first noncontact vehicle and the driver of the second² noncontact vehicle observed the child pedestrian crossing the roadway north to south. According to this contractor's interview with the driver of the second noncontact vehicle, he indicated that the child had stooped over to pick up something she had dropped on the roadway just prior to the impact. According to the police investigation, there is no indication that the driver of the case vehicle ever saw the child pedestrian, and thus, the case vehicle's driver made no pre-crash avoidance maneuvers. The case vehicle accelerated straight ahead before the female student had cleared the bus's front. The impact occurred in the westbound lane of the roadway.

CRASH: According to the police investigation and the child pedestrian's autopsy, the front left portion of the case vehicle's front bumper contacted her left side, knocking her to the pavement. According to the injuries identified in this child's autopsy, this contractor believes that the child was knocked to the pavement, on her back, with her head pointing almost due west, parallel with the roadway (approximately 260 degrees), and her right side nearest to the on-coming case vehicle. The case vehicle's left front tire, followed by the left rear dual tires, passed over, primarily, the right side of the child's torso and head. According to the police investigation, the case vehicle's driver "heard a thump", steered the case vehicle partially onto the north shoulder, and came to rest.

POST-CRASH:

Occupants: According to the police investigation, the driver of the case vehicle remained inside the vehicle at final rest, was conscious, and exited the case vehicle to determine the cause of the "thump". According to the vehicle inspection, the case vehicle's driver had an active, two-point, lap belt available, but it is not known if the belt was used. According to the police investigation and a witness, the case vehicle's driver became extremely distraught after discovering the child pedestrian. According to the police investigation, the child pedestrian was lying in a near east-west direction with her head towards the west. She was unconscious and unable, because of her injuries, to move.

Police: The investigating police agency received a "911" call concerning the crash from an office in the State of Indiana who was notified by a radio call from a witness at the scene. The agency arrived on-scene within six minutes. Emergency medical services were already on scene when the police agency arrived. Traffic control procedures were established and no additional resources were required.

Rescue: According to the police investigation, the driver was uninjured, but she was so distraught that she was transported by ambulance to a medical facility where she was treated and released. The child pedestrian (former bus passenger) was transported by ambulance to a medical facility where she was pronounced dead. According to the child's autopsy, she sustained fatal brain injuries which included: a right cerebral laceration; multiple, unspecified, cerebral contusions; a

COLLISION SEQUENCE (CONTINUED)

POST-CRASH: Rescue: (Continued)

comminuted basilar skull fracture; a displaced right skull fracture; and a left skull fracture. Her trunk sustained bilateral lung contusions, multiple liver lacerations, and a complete transection to her urinary bladder. In addition, she sustained multiple contusions and abrasions.

Removal: Following the police investigation, the case vehicle was driven from the scene to a police impound lot.

HUMAN FACTORS/OCCUPANT DATA

	<u>Case Vehicle</u>	<u>Pedestrian</u>
OPERATORS:	50 year-old female	5 year-old female
Height:	Unknown	116 cm (45-46 in)
Weight:	Unknown	17 kg (35-40 lbs)
Occupation:	School Bus Driver	Student
Active Restraint System/Usage:	2-point lap/Unknown if used	Not applicable
Usage Source:	Vehicle inspection, In- terviewee, and Police Accident Report	Not applicable
Passive Restraint System/Usage:	Not equipped	Not applicable
Usage Source:	Not applicable	Not applicable
Eye glasses/contacts:	Unknown	Unknown
Experience driving school buses (total experience):	Unknown	Not applicable
Vehicle Familiarity:	Unknown	Not applicable
Route Familiarity:	Daily	Daily
Trip Plan:	Complete school bus route	School to home by bus
Manner of Leaving Scene:	Ambulance	Ambulance
Type of Medical Treatment:	Treated and released	Dead on arrival

CASE VEHICLE DRIVER INJURIES

<u>Description of Injury</u>	<u>A.I.S.</u>	<u>Source of Data</u>	<u>Injury Mechanism</u>	<u>Certainty</u>
Not injured	0	9	Not applicable	Not applicable

PEDESTRIAN INJURIES^{3,4}

<u>Description of Injury</u>	<u>A.I.S.</u>	<u>Source of Data</u>	<u>Injury Mechanism</u>	<u>Certainty</u>
Laceration right hemisphere with exposure of anterior horn of right ventricle	140688.4,1	1	Left front and rear tires	{Certain}
Cerebral contusions, location not specified	140612.3,9	1	Left front and rear tires	{Certain}
Contusions lungs, bilaterally, including both upper lobes and posterior right lower lobe	441410.4,3	1	Left front and rear tires	{Certain}
Lacerations, deep, right lobe of liver and quadrate lobe near falciform ligament	541824.3,1 ³	1	Left front and rear tires	{Certain}
Transection, complete, urinary bladder	540624.4,8 ³	1	Left front and rear tires	{Certain}
Fracture, middle cranial fossa with comminution	150206.4,8	1	Left front and rear tires	{Certain}
Fracture, gaping, right parietotemporal bones with cerebral cortical tissue exuding ⁴	150404.3,1	1	Left front and rear tires	{Certain}
Fracture, left parietotemporal bones	150402.2,2	1	Left front and rear tires	{Certain}
Laceration superior margin right ear	290602.1,1	1	Left front and rear tires	{Certain}
Laceration, 1 cm, right parietal scalp, 5 cm above mastoid process	290602.1,1	1	Left front and rear tires	{Certain}
Abrasions forehead	290202.1,7	1	Left front and rear tires	{Probable}
Contusions nose	290402.1,4	1	Left front and rear tires	{Probable}
Abrasion right elbow	790202.1,1	1	Left front and rear tires	{Probable}
Contusion right deltoid area	740402.1,1	1	Left front and rear tires	{Probable}

³ These A.I.S. codes are "best fit" descriptions for the actual reported injuries.

⁴ A dictionary defines this term as follows:
exude {ing} (ig zōōd' or ik sōōd') *to come out gradually in drops, as sweat through pores or small openings; ooze out.*

PEDESTRIAN INJURIES (CONTINUED)

<u>Description of Injury</u>	<u>A.I.S.</u>	<u>Source of Data</u>	<u>Injury Mechanism</u>	<u>Certainty</u>
Contusion involving right lower quadrant of abdomen, right iliac crest, and proximal anterior thigh	890402.1,1	1	Left front and rear tires	{Certain}
Contusion over left iliac crest	890402.1,2	1	Front bumper	{Probable}

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS

Mirror adjustment is a critical part of the driver's field-of-vision. The TRC investigators constructed the sixteen-cylinder School Bus Field-of-View Test as depicted on page 57017 of the *Vol.57, No.232 / 1992 / Rules and Regulations* and shown schematically on page 13 of this report. The case school bus was equipped with four exterior mirrors: a unit magnification mirror at the left "A"-pillar, a "banana" convex mirror at the left front corner, a "banana" convex mirror at the right front corner, and a unit magnification mirror at the right "A"-pillar. The mirrors are described in the table below; all location measurements were made to the bottom center of the metal enclosing the reflective surfaces.

SCHOOL BUS REARVIEW MIRRORS								
Mirror Number	Side of Bus	Mirror Location	Mirror Shape	Mirror Dimensions	Magnification	Distance from the transverse vertical plane tangent to the windshield's base	Distance from the longitudinal vertical plane tangent to the side	Distance upward from the ground
1	Left	Left side	Rectangular	18 cm (7.0 in) x 41 cm (16.0 in)	Unit	-1.3 cm (-0.5 in)	+20 cm (+7.75 in)	185 cm (73.0 in)
2	Left	Left front	Elliptical	17 cm (6.75 in) x 41 cm (16.0 in)	Convex	+127 cm (+50.0 in)	+6 cm (+2.25 in)	142 cm (56.0 in)
3	Right	Right front	Elliptical	17 cm (6.75 in) x 41 cm (16.0 in)	Convex	+137 cm (+54.0 in)	-3 cm (-1.0 in)	144 cm (56.8 in)
4	Right	Right side	Rectangular	18 cm (7.0 in) x 41 cm (16.0 in)	Unit	+23 cm (+9.0 in)	+11 cm (+4.5 in)	188 cm (74.0 in)

Although this case vehicle was manufactured long before the current FMVSS 111 went into effect, there has been an obvious attempt to upgrade the mirrors at the front of the bus to comply with the spirit of the revised standard. Since the left and right outside unit magnification

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONTINUED)

mirrors (i.e., Mirrors 1 and 4) appear to be original equipment, under the provisions of the current standard they would be designated as System A mirrors. Likewise, under the provisions of the current standard the front corner mirrors (i.e., Mirrors 2 and 3) would be designated as System B mirrors.

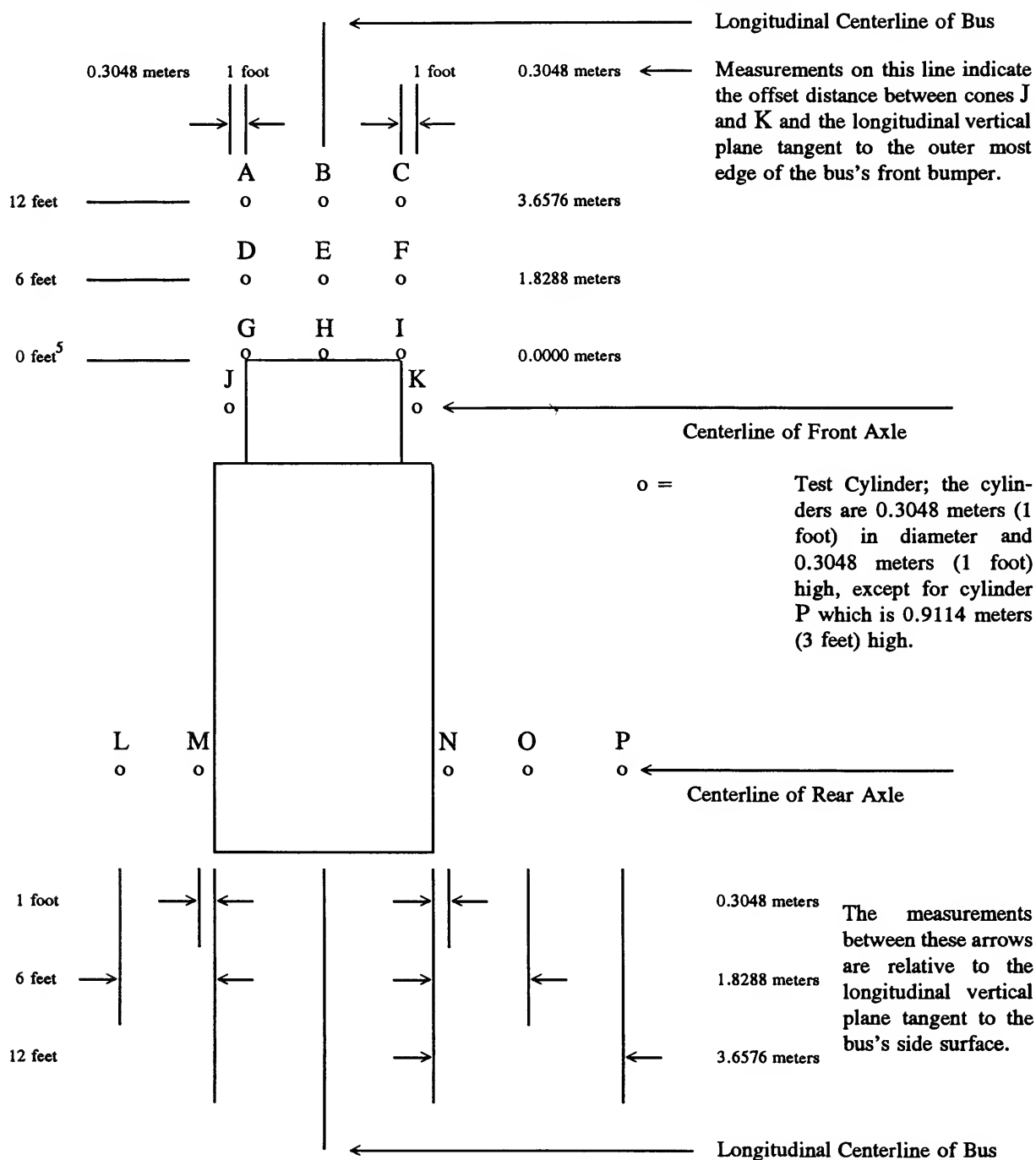
The following list contains a narrative description for each mirror of what can be seen in the accompanying color photographs. The camera view was either a 55 millimeter (normal) or 135 millimeter (telephoto) lens, and the photographer was either in a "normal" or "leaning" driver posture.

- o Mirror 1 (System A: left, rearview, unit magnification)--The left side of the school bus is not visible. Little, if any, of the pavement forward of the transverse vertical plane tangent to the bus's rear bumper can be seen from a seated driver's posture. No cones can be seen (i.e., cones J, L, and M are not visible); see **SELECTED PHOTOGRAPHS #27** and **#28**.
- o Mirror 2 (System B: left, outside "banana" convex)--In the left third of this mirror, cones J, L, and M are visible, as well as the vast majority of the bus's left side, stop arm, and pavement rearward of the left front tire. Only four (B, C, E, and F) of the nine frontal cones (i.e., A through I) are visible in the right third of this mirror. The "brown" mark immediately to the right of the mirror bracket shown in **SELECTED PHOTOGRAPHS #31** and **#32** is the "extended yardstick" [122 centimeters (48 inches)--see **SELECTED PHOTOGRAPHS #09, #10, #11, and #12**]. Although the female pedestrian's exact location along the frontal plane is unknown, if she was less than two-thirds of the way across the front of the bus (measured right to left), then she was probably not visible in this mirror. It should be noted that the "image clarity" at both ends of this "banana" mirror was lacking in this contractor's opinion. In addition, the large center area of the mirror (i.e., the best image clarity) reflects the left front corner, left side, and frontal plane of the bus. This indicates that this mirror was not properly positioned for its intended purpose (i.e., cones A through J).
- o Mirror 3 (System B: right, outside "banana" convex)--The forward half of cone H is the only one of the nine frontal cones (i.e., cones A through I) visible in the left third of this mirror. Although the female pedestrian's exact location along the frontal plane is unknown, it is possible that she could have been visible in this mirror if she was adjacent to (i.e., as opposed to away from) the bumper and had stooped to pick up the dropped item just prior to reaching the location of cone H (see **SELECTED PHOTOGRAPHS #37** and **#38**). Cones O and P are visible in the right third of this mirror; right side cones K and N are not visible. The coloration on the right side of the bus is not cone N; rather, it is a yellow or red circular reflector (see **SELECTED PHOTOGRAPHS #15--right side, and #17 and #18--left side**). Once again, it should be noted that the "image clarity" at both ends of this "banana" mirror was lacking in this contractor's opinion. In addition, the large center area of the mirror (i.e., the best image clarity) reflects the right front corner, right side, and frontal plane of the bus. This indicates that this mirror was not properly positioned for its intended purpose (i.e., cones A through I and K).

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONTINUED)

LOCATION OF TEST CYLINDERS FOR SCHOOL BUS FIELD-OF-VIEW TEST

Based Upon: Figure 2:

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1992 / Rules and Regulations -- Page 57017

⁵ Cylinders G, H, and I are located tangent to the transverse vertical plane at the front edge of the school bus's front bumper [i.e., the center of these test cylinders is 0.5 feet (0.1524 meters) in front of the bumper]. The six and twelve foot longitudinally forward locations of cylinders D, E, and F and A, B, and C, respectively, are measured with respect to the center of the cylinders.

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONTINUED)

- o Mirror 4 (System A: right, rearview, unit magnification)--The right side of the school bus is visible from the first passenger window rearward. The pavement cannot be seen from approximately forward of the right rear dual wheels. No cones can be seen (i.e., i.e., cones **K**, **N**, **O**, and **P** are not visible); see **SELECTED PHOTOGRAPHS #39** through **#41**.
- o Windshield--From the driver's seat, none of the nine forward cones (i.e., cones **A** through **I**) are directly visible through the windshield (see **SELECTED PHOTOGRAPHS #24**, **#25**, and **#26**). Bricks were used to hold the tape measures which formed the longitudinal extensions of the outermost edges of the front bumper and bus's centerline (see **SELECTED PHOTOGRAPHS #09**, **#10**, and **#11**). Two bricks⁶ are visible in **SELECTED PHOTOGRAPHS #24** and **#25**; they were approximately 6.1 meters (20 feet) forward of the bus's front bumper.

The following table summarizes the test cone visibility from the driver's seat.

Directly visible with the human eye	No cones are directly visible.
Mirror 1	No cones can be seen.
Mirror 2	Left side cones J , L , and M are visible. Forward cones B , C , E , and F are visible. Forward cones A , D , G , H , and I are not visible.
Mirror 3	Right side cones O and P are visible while cones K and N are not visible. Forward cone H is partially visible. Forward cones A , B , C , D , E , F , G , and I are not visible.
Mirror 4	No cones can be seen.

Although the standard specifies the height and diameter of the cylindrical cones (i.e., see page 18 of this report), the TRC used the following three types of available cones.

Position	Type of Cone	Height	Base
A through F , H , and J through O	Sport cones	23 cm (9 in)	15 cm (6 in) in diameter
G and I	Safety cone	30 cm (12 in)	22 cm (8.5 in) square
P	Safety cone and sport cone combination	76 cm (30 in)	32 cm (17.75 in) square

No attempt was made to adjust the photographs for the driver's height. The height of the TRC photographer is 183 centimeters (72 inches); the height of the school bus driver is unknown.

⁶ The left visible brick is in line with cones **A**, **D**, **G**, and the right brick is in line with cones **C**, **F**, and **I**.

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONTINUED)

In addition, no attempt was made to photograph the cones from the school bus "driver's eye location" in accordance with all of the requirements specified in Figure 3 and on pages 57018 through 57020 of the *Vol. 57, No. 232 / 1992 / Rules and Regulations.*

TEST CYLINDER (CONE) VISIBILITY	
Cone	Photograph Numbers
A:	9, 10, 11, 12, 22, 23
B:	9, 10, 11, 12, 15, 22, 23, 24, 29, 30, 31, 32, 33, 34
C:	9, 10, 11, 12, 15, 21, 22, 24, 29, 30, 31, 32, 33 ⁷ , 34
D:	9, 10, 11, 12, 21, 23
E:	9, 10, 11, 12, 21, 22, 23, 24 ⁸ , 29, 30, 31, 32, 33, 34
F:	9, 10, 11, 12, 15, 20, 21, 22, 23, 24, 29, 30, 31, 32, 33, 34 ⁴
G:	9, 10, 11, 12, 13 ⁵ , 19, 20, 23
H:	9, 10, 11, 12, 13, 19, 20, 21 ⁵ , 23, 26 ⁵ , 35 ⁵ , 36 ⁵ , 37 ⁵ , 38 ⁵
I:	9, 10, 11, 12, 13, 15 ⁵ , 17 ⁵ , 19 ⁵ , 20, 21, 23
J:	9, 10, 11, 12, 17, 19 ⁵ , 20 ⁵ , 23, 29, 30, 31, 32, 33, 34
K:	9, 10, 11, 12, 13, 15, 17 ⁵ , 23 ⁵
L:	9, 10, 11, 16 ⁵ , 17, 18, 29, 30, 31, 32, 34
M:	9, 11 ⁹ , 17, 18, 23, 29, 30, 31, 32, 33, 34
N:	11, 12, 15, 16 ⁵ , 23 ⁵ , 35 ¹⁰ , 36 ⁷ , 37 ⁷ , 38 ⁷
O:	9, 10, 11, 15, 17 ⁵ , 26 ⁵ , 35, 36, 37, 38
P:	10 ⁵ , 14, 26, 35, 36, 37, 38

According to the school bus inspection report, the police noted that "... the mirror adjustment at the front of the vehicle provided a very limited view to the frontal area of the vehicle." law requires that "the driver, in a normal seated position, either by direct vision or by use of an indirect vision mirror system, shall be able to observe objects on the roadway in front of and beside the vehicle located inside a continuously visible rectangu-

⁷ In this photograph the cone is being pointed at with a measuring stick.

⁸ This cone is only partially visible in this photograph.

⁹ In this photograph, one can see part of this cone through the left hole in the front bumper.

¹⁰ The reddish-orange object along the school bus's right side is not cone N; instead, it is the reflection of a circular reflector.

LF _____

DEPARTMENT OF PUBLIC HEALTH

STATE FILE NUMBER _____

CF _____

CERTIFICATE OF DEATH

TYPE/PRINT
IN
PERMANENT
BLACK INK

1 DECEDENT'S NAME (First, Middle, Last)				2 SEX Female		3 DATE OF DEATH (Month, Day, Year) 1995	
4a AGE - Last Birthday (Years) 5		4b UNDER 1 YEAR MONTHS DAYS		4c UNDER 1 DAY HOURS MINUTES		5 DATE OF BIRTH (Month, Day, Year) 1990	
7a LOCATION OF DEATH (Enter place officially pronounced dead in 7a, 7b, 7c.) HOSPITAL OR OTHER INSTITUTION - Name (If not in either, give street and number) Emergency Room				7b IF HOSP OR INST Inpatient, Op / Emer. Room, DOA (Specify)		7c CITY, VILLAGE, OR TOWNSHIP OF DEATH	
8 SOCIAL SECURITY NUMBER		9a USUAL OCCUPATION (Give kind of work done during most of working life. Do not use retired) Student				9b KIND OF BUSINESS OR INDUSTRY School	
10a CURRENT RESIDENCE - STATE		10b COUNTY		10c LOCALITY (Check one box and specify) <input type="checkbox"/> INSIDE CITY OR VILLAGE OF <input checked="" type="checkbox"/> TWP OF		10d STREET AND NUMBER	
10e ZIP CODE		11 BIRTHPLACE (City and State)		12 MARITAL STATUS - Married, Never Married, Widowed, Divorced (Specify)		13 SURVIVING SPOUSE (If wife, give name before first married)	
14 WAS DECEDENT EVER IN U.S. ARMED FORCES? (Specify Yes or No) No		15 ANCESTRY - Mexican, Puerto Rican, Cuban, Central or South American, Chicano, other Hispanic, Afro-American, Arab, English		16 RACE - American Indian, Black, White, etc. If Asian, give nationality i.e. Chinese, Filipino, Asian Indian, etc. (Specify below) White		17 DECEDENT'S EDUCATION (Specify only highest grade completed) Elementary/Secondary (0-12) College (14 or 16+) 0	
18 FATHER'S NAME (First, Middle, Last)				19 MOTHER'S NAME (First, Middle, Surname before first married)			
20a INFORMANT'S NAME (Type/Print)				20b MAILING ADDRESS (Street and Number or Rural Route Number, City or Village, State, ZIP Code)			
21 METHOD OF DISPOSITION - Burial, Cremation, Removal, Donation, Other (Specify) Burial				22a PLACE OF DISPOSITION (Name of Cemetery, Crematory, or other place)		22b LOCATION - City or Village, State	
23 SIGNATURE OF FUNERAL SERVICE LICENSEE				24 LICENSE NUMBER (of licensee)		25 NAME AND ADDRESS OF EMPLOYER	
26 PART I Enter the diseases, injuries, or complications that caused the death. Do NOT enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. List only one cause on each line. IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Skull Fracture DUE TO (OR AS A CONSEQUENCE OF) b. DUE TO (OR AS A CONSEQUENCE OF) c. DUE TO (OR AS A CONSEQUENCE OF) d. DUE TO (OR AS A CONSEQUENCE OF) Approximate Interval Between Onset and Death 30 minutes							
PART II Other significant conditions contributing to death but not resulting in the underlying cause given in Part I						27a WAS AN AUTOPSY PERFORMED? (Yes or No) Yes	
						27b WERE AUTOPSY FINDINGS AVAILABLE PRIOR TO COMPLETION OF CAUSE OF DEATH? (Yes or No) Yes	
28 ACTUAL PLACE OF DEATH (Home, Nursing Home, Hospital, Ambulance) (Specify)				29 WAS CASE REFERRED TO MEDICAL EXAMINER? (Specify Yes or No) Yes		31a (Check one only) <input type="checkbox"/> The case reviewed and determined not to be a medical examiner's case <input checked="" type="checkbox"/> On the basis of examination and of investigation, in my opinion death occurred at the time, date and place stated.	
30a To the best of my knowledge, death occurred at the time, date and place and due to the cause(s) stated. (Signature and Title) →				30b DATE SIGNED (Mo., Day, Yr.)		30c TIME OF DEATH M	
30d NAME OF ATTENDING PHYSICIAN IF OTHER THAN CERTIFIER (Type or Print)				31b DATE SIGNED (Mo., Day, Yr.) 1995		31c CASE NUMBER None	
				31d PRONOUNCED (Mo., Day, Yr.) 1995		31e TIME OF DEATH M	
32a NAME AND ADDRESS OF PERSON WHO COMPLETED CAUSE OF DEATH (Item 26) (Type or Print)				32b LICENSE NUMBER			
33a ACC. SUICIDE, HOM. NATURAL OR PENDING INVEST (Specify) Accident		33b DATE OF INJURY (Mo., Day, Yr.) 1995		33c TIME OF INJURY		33d DESCRIBE HOW INJURY OCCURRED Pedestrian-schoolbus accident	
33e INJURY AT WORK (Specify Yes or No) No		33f PLACE OF INJURY - At home, farm, street, factory, office building, etc. (Specify) Highway		33g LOCATION - Street or RFD No. City, Village or Twp. State			
34a REGISTRAR'S SIGNATURE				34b DATE FILED (Month, Day, Year)			

Case No.

(DO NOT FILL IN)

MEDICAL EXAMINER'S REPORT

Address

Marital

M W S D

Occupation

Next of Kin:

(address)

BEST AVAILABLE

**MEDICAL EXAMINER'S REPORT
AND
CERTIFICATE OF DEATH**

identified. There is a violaceous contusion of the right deltoid area.

INTERNAL INJURIES

After reflection of the scalp, a mild amount of hemorrhage of the soft tissues of the right temporal and left mastoid area are noted. Fractures on the right side of the skull include a long fracture line corresponding to the parietotemporal suture with complete fracture and freeing of a segment of temporal bone, slightly anterior to the auditory canal. A fracture line also continues across the frontal bone. These fractures are gaping with some cerebral cortical tissue exuding.

Examination of the left aspect of the skull shows a fracture line corresponding to the parietotemporal suture superior to the mastoid process which continues posteriorly along the occipital suture. There is hemorrhage. No cerebral tissue is noted protruding through this fracture line.

After removal of the calvarium and the brain, the dura is stripped and examination of the interior base of the skull shows complete fracture across the base of the skull with a gaping fracture line causing the anterior cranial fossa and posterior cranial fossi to be easily separated. The fracture line corresponds approximately to the mid portion of the middle cranial fossa and courses posterior to the pituitary fossa. Small branches course anteriorly across the middle fossa on both the right and left sides paralleling the lesser wing of the sphenoid. As noted with flexion, this fracture line is easily separated. There is accompanying hemorrhage.

Examination of the brain shows marked laceration with exposure of the anterior horn of the ventricles at the inferior frontal gyrus of the right hemisphere.

During internal examination of the abdominal cavity, the injuries identified included lacerations of the anterior surface of the right lobe of the liver with deep penetration into its substance. There is also laceration of the quadrate lobe and in the region of the falciform ligament. The bladder is also transected. There is negligible free sanguinous fluid in the abdominal cavity. The soft tissues of the lower abdomen contain a small amount of hemorrhage.

PRIMARY INCISION

The thoracic and abdominal cavities are opened using the usual Y-shaped incision. On reflection of the soft tissues of the chest, fractures of the fourth and fifth right ribs are noted just lateral to the costochondral junctions. There is minimal associated hemorrhage. On removal of the chest plate, no free fluid is noted in either the right or left thoracic cavities. The thymus gland is in normal location. It has a tan, uniform consistency and weighs 30 gm.

HEART

On opening the pericardial sac, a small amount of pericardial fluid is present. The epicardium is smooth and glistening. The great vessels enter and exit and the heart in an appropriate fashion and there are no lacerations of the heart or great vessels. The heart weighs 70 gm. The coronary arteries arise normally at the aortic cusps and distribute normally. There is no dilatation of the ventricles. The endocardium is smooth and glistening. The valves are competent. The atrial and ventricular septa are intact.

The great vessels in the chest and abdomen are normal in distribution without stenosis.

LUNGS

There are no pleural adhesions or effusions. The right lung weighs 140 gm. It

shows purple blue contusions, most prominently in the upper lobe and posterior lower lobes and on sectioning it appears relatively well aerated. The left lung weighs 80 gm and has a small number of similar contusions in the apical aspect of the upper lobe. On opening the trachea and bronchi, they are patent.

LIVER

The liver weighs 450 gm. Lacerations of the right lobe, quadrate lobe and in the area of the falciform notch are noted. There is minimal hemorrhage. On sectioning, the liver has a normal consistency.

GALLBLADDER

The gallbladder is in normal position and contains a small amount of bile.

SPLEEN

The spleen weighs 50 gm and has a uniform consistency. The cut surface shows slight pebbling.

PANCREAS

The pancreas is in a normal location and has a uniform, tan coloration and lobulated consistency without masses.

KIDNEYS

Each kidney weighs 50 gm. They appear pale, although margination of cortex to medulla is noted. The renal arteries are patent without stenosis or laceration. The ureters are unremarkable.

BLADDER

The bladder has been lacerated with complete transection.

GASTROINTESTINAL TRACT

The GI tract is examined from the upper esophagus to the rectum approximately 30 cc of cloudy brown fluid is present in the stomach. The mucosa is unremarkable. No lacerations of esophagus, stomach, small or large bowel are noted. A moderate amount of fecal material is present in the descending and sigmoid colon. The appendix is present.

Due to the nature of the injuries and the incident, microscopic examination will not be performed on this case. Tissues are being retained in the event that future microscopic examination is deemed necessary.

DOB:

95

GROSS AUTOPSY PROTOCOL

Permission for complete autopsy exam is granted by Chief Medical
Examiner for The autopsy is begun at on 95. In
attendance at the time of autopsy are myself and assistant.

CIRCUMSTANTIAL SUMMARY

The deceased reportedly exited a school bus near her home and while crossing the street she was run over by the bus.

EXTERNAL EXAMINATION

The body is that of a well developed, well nourished, clean white female appearing the stated age of five years. The body measures 3'9" to 3'10" in length and weighing approximately 35-40 pounds. There are hospital identification bracelets on the right wrist and right ankle. The head is covered by long brown hair in pigtails with one black and one purple tie. The left eye is covered by gauze. The right pupil is dilated and a scar is present on the cornea. EKG patches are present on the chest. Intraosseous lines are present in both tibia. There is gauze on the dorsum of the left hand. An endotracheal tube is present loosely by the body. There are venipuncture marks on the right and left antecubital fossa. There is mild pectus excavatum.

EVIDENCE OF INJURY

EXTERNAL

Examination of the head shows marked abnormality. There is blood present on the left side of the head and face. Blood is present in the right external auditory canal. There is a small tear of the superior margin of the right ear. Palpation of the scalp reveals an irregular step-like fracture line involving the right temporal area as well as the right mastoid fossa. A 1 cm linear laceration is present in the parietal area of the scalp approximately 5 cm above the mastoid process. There is a second step fracture noted on the left post-auricular area adjacent to the left mastoid process. Fracture line can be felt progressing posteriorly for a short distance into the occipital area.

Also noted in the left temporal area is a bald spot 4 cm in diameter without associated soft tissue damage. Palpation of the underlying skull is unremarkable.

Other evidence of injury consists of abrasions of the forehead and right eyebrow with drying. The tip and bridge of the nose are bruised with violaceous coloration. Blood is noted in both nares. There are also abrasions with drying on the left perioral region of the face. Examination of the chest is unremarkable except for the previously mentioned pectus excavatum. The right lower quadrant of the abdomen as well as the areas of the anterior iliac crest and proximal anterior thigh show a blue discoloration with some swelling, similar coloration is also noted over the left iliac crest. There is swelling of the right labia majora. No lacerations are

Hospital

AUTOPSY AUTHORIZED
CHIEF MEDICAL EXAMINER,

AUTOPSY

EXPIRED: 95
AUTOPSY: 95

AGE: 5 SEX: F RACE: Cauc.
PROSECTOR:

FINAL AUTOPSY DIAGNOSIS

1. Severe blunt force trauma to the skull and abdomen resulting in
 - a. Multiple severe cranial fractures of calvarium and base of skull with marked cerebral contusions.
 - b. Lacerations of liver and bladder.
 - c. Contusions of pelvis with adjacent soft tissue hemorrhage.
 - d. Fractures of fourth and fifth right ribs.
 - e. Pulmonary contusions.

95

Pathologists

FEDERAL MOTOR VEHICLE SAFETY STANDARD 111, REARVIEW MIRRORS (CONTINUED)

lar area having a length defined as the length of the vehicle plus not less than 18 feet (5.5 meters) in front of the vehicle and a width defined as the width of the vehicle plus not less than 2 feet (0.6 meters) on either side of the vehicle. A mirror used to comply with this subsection shall be at least 7.5 inches (19 centimeters) in diameter and convex in shape." The

school bus inspection report also notes that the has permitted the mounted "*banana mirrors*" as meeting the 7.5 inch diameter convex rule. In addition, the "**Report**" indicated "that the placement and adjustment of these cross view mirrors provided a greater field of vision down each side of the vehicle than across the front of the vehicle as they were intended." Finally, the "**Report**" indicated this school bus, in its present condition, would not have passed inspection for the purpose of "transporting any passengers"

In our opinion, both the left and right rearview, unit magnification (i.e., System A) mirrors and both elliptical, convex (i.e., System B) mirrors could have been better adjusted, based on our vehicle inspection. In addition, the convex mirrors could possibly have been better positioned to provide visibility of all nine forward cones (i.e., A through I). According to the investigating police agency, these mirrors have not been readjusted between the incident date and the date this contractor inspected the school bus, because the bus is being held in a locked facility and preserved as evidence in a pending criminal prosecution with special attention made to guaranteeing the proper "*chain-of-custody*".

DISCUSSION

If the field-of-view recommended by FMVSS 111 or by had been available in this incident, the female pedestrian would have been visible in a properly placed and adjusted mirror system.

Appendix A:

**FINAL RULE FOR
FEDERAL MOTOR VEHICLE SAFETY STANDARD,
NUMBER 111, REARVIEW MIRRORS
(CONVEX CROSS VIEW MIRRORS ON SCHOOL BUSES)**

both sides of school buses; to specify certain criteria for convex cross view mirrors; and to establish test conditions designed to ensure that the image of an object is sufficiently clear. The amendments will improve the view around stopped school buses, thus reducing the risk of school buses striking student pedestrians.

DATES: *Effective Date:* The amendments become effective 1993.

Petitions for reconsideration: Any petitions for reconsideration of this rule must be received by NHTSA no later than 1993.

ADDRESS: Any petition for reconsideration should refer to the docket and notice number set forth in the heading of this notice and be submitted to: Administrator, NHTSA.

FOR FURTHER INFORMATION CONTACT:

SUPPLEMENTARY INFORMATION:

Outline

- I. Background
- II. Previous Agency Action
 - A. Advance Notice of Proposed Rulemaking
 - B. Notice of Proposed Rulemaking
- III. Agency Determination
 - A. General Considerations
 - B. Field-of-view requirements
 - C. Test Cylinders
 - 1. Cylinder Placement
 - 2. Cylinder Dimensions
 - 3. Cylinder Color
 - D. School Bus Mirror Systems
 - 1. General
 - 2. Driving Mirrors—"System A" Mirrors
 - 3. Convex cross view mirrors—"System B" Mirrors
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 - b. Accommodation distances
 - c. Discontinuities in a mirror surface's slope
 - d. Mirror supports and adjustment
 - e. Informational label on using cross view mirrors for driving purposes
 - f. Performance requirements for image clarity
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 - E. Testing procedures
 - 1. General
 - 2. Testing reference point 25th percentile female
 - 3. Mirror adjustment during testing
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 - 1. Certification
 - 2. Retrofitting
 - 3. Applying requirements to buses other than school buses
 - 4. Heated mirrors
 - 5. Maximum permissible number of mirrors

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety
Administration

49 CFR Part 571

**Federal Motor Vehicle Safety
Standards; Convex Cross View Mirrors
on School Buses**

AGENCY: National Highway Traffic
Safety Administration (NHTSA), DOT.
ACTION: Final rule.

SUMMARY: This notice amends Federal motor vehicle safety standard No. 111, Rearview Mirrors, with respect to the field-of-view around school buses. The notice amends the standard to require a bus driver to be able to see, either directly or through mirrors, certain specified areas in front of and along

- 6. Blind spots
- 7. Glare from mirrors
- 8. Non-mirror systems
- G. Costs
- H. Leadtime requirements
- IV Rulemaking Analyses and Notices
 - A. Executive Order (Federal Regulation) and DOT Regulatory Policies and Procedures
 - B. Regulatory Flexibility Act
 - C. Executive Order (Federalism)
 - D. National Environmental Policy Act

I. Background

School buses provide an extremely safe form of transportation. On a vehicle-mile basis, school buses are about four times safer than passenger cars. Despite this outstanding safety record, injuries and fatalities do occur, with most of them occurring to pedestrians outside the school bus. According to the 1989 report by the National Academy of Sciences (NAS), "Improving School Bus Safety," an average of 38 pedestrians are killed each year in school bus-related incidents. Of these 38 pedestrian fatalities, an average of 26 result from students being struck by their own school bus and 12 result from being struck by another vehicle. The NAS report also estimated that 283 children suffer mostly minor injuries, when they are struck by their own bus. The NAS report concluded that since children are at greater risk of being killed in school bus loading zones (i.e., boarding and leaving the bus) than on board school buses, "a larger share of the school bus safety effort should be directed to [improving the safety of] bus stops and loading zones."

NAS accordingly made two specific recommendations to NHTSA. First, to reduce the number of students who are struck by vehicles illegally passing a stopped school bus, NAS recommended the establishment of a Federal motor vehicle safety standard requiring the installation of stop signal arms on all new school buses. (The agency has published Federal motor vehicle safety standard 131, "School Bus Pedestrian Safety Devices," which becomes effective for all new school buses produced on or after 1992. 56 FR 20363, 1991). Second, to reduce the number of children who are struck by their own school bus, NAS recommended that NHTSA "reexamine its standards for cross view mirrors to determine whether current specifications can be modified to give the driver a better view of the areas in front of and immediately beside the bus."

Federal motor vehicle safety standard No. 111, Rearview Mirrors, (49 CFR 571.111) currently requires each school bus that is not a forward control vehicle,

i.e., a transit style bus, to have an outside cross view mirror of a specified size and shape (S9.2), "mounted so as to provide the driver a view of the front bumper and the area in front of the bus" (S9.2(b)). The standard also requires each school bus to have an outside rearview mirror of unit magnification (i.e., flat mirror) on each side of the bus, to provide the driver with a view to the rear along both sides of the bus (S9.1). In addition to meeting the requirements in Standard No. 111, school buses are required by nearly every State to be equipped with additional mirrors, particularly cross view mirrors.

As noted earlier, an average of 26 students are killed each year and 283 are injured each year after being struck by their own school bus. These incidents are rare. Nevertheless, the potential for such tragedies is actually quite large because every time a student gets on or off a school bus, there is a chance that the driver may not see that student in the proximity of the bus. According to the 1989 NAS report, of the 26 students killed as pedestrians each year "two-thirds are struck by the front of the bus and one-third by the rear of the bus, usually the rear wheels." A review of specific incidents reveals that the fatalities occurred because the driver did not see the child in front of or to the side of the bus. In many cases in which the child was struck by the bus's rear wheels, the bus had already left the bus stop. In these cases, the children were typically running after the moving bus and fell under the rear wheels. Such incidents cannot be totally avoided through changes to the mirror requirements, since driver error may be a significant cause of many such incidents. In addition, once the school bus is moving, the driver must focus on other driving actions in addition to looking into the mirror systems to check for students around the outside of the bus. However, to reduce the likelihood of students being struck by their own bus in the school bus loading zone, the agency has conducted this rulemaking to improve the means available for the school bus driver to detect their presence around the stopped bus.

The Department of Transportation conducts an annual nationwide "School Bus Loading and Unloading Survey" which reviews every school bus pedestrian fatality. This study confirms that a significant, although decreasing, number of pedestrians are killed by school buses. The data indicate that the number of pupils killed nationwide in school bus loading zones was 45 in 1985, 42 in 1986, 32 in 1987, 16 in 1988, 17 in 1989, and 18 in 1990. The agency

believes that the decrease in the number of school bus loading zone fatalities is due to a combination of factors, including the use of more and better mirrors, the increased use of stop signal arms, and improved school bus driver and student training. Despite this trend, this type of incident remains the most common way students are killed in school bus-related incidents. Therefore, the agency has conducted this rulemaking to upgrade Standard No. 111's mirror requirements to reduce further the potential for fatalities and injuries to students by school buses.

II. Previous Agency Action

A. Advance Notice of Proposed Rulemaking

On 1989, NHTSA published an Advance Notice of Proposed Rulemaking (ANPRM) announcing the agency's interest in measures designed to prevent children from being struck by school buses during and after loading and unloading operations. 54 FR . . . The ANPRM asked questions about pedestrian safety around school buses to assist the agency in deciding whether to pursue rulemaking on cross view mirror systems and other devices designed to protect pedestrians from being struck by the school bus (e.g., crossing control arms, sensors, or video monitors). Among the issues presented were: (1) The safety need for amending the mirror requirements or for requiring additional equipment such as crossing control arms; (2) the need to develop performance requirements to ensure that a driver sees or is otherwise aware of pedestrians in school bus loading zones; (3) the costs of requiring different types of or additional mirror systems and of requiring other types of equipment; and (4) the potential impact of new requirements on school bus users currently in compliance with FMVSS No. 111 and on current . . . that would differ from the requirements that might be proposed.

The agency received comments from State and organizations, school bus manufacturers, mirror and other equipment manufacturers, associations, and individuals. The commenters generally agreed that measures should be taken to reduce the number of children struck by school buses and to improve the view of school bus drivers around the school bus while it is in the school bus loading zone. Commenters also addressed other issues raised in the ANPRM, including the need for devices other than mirror systems for increasing school bus drivers' awareness of

children outside of school buses, the benefits from training programs, and the costs of the equipment addressed in the ANPRM.

B. Notice of Proposed Rulemaking

Based on the comments received to the ANPRM and the results of NHTSA research conducted by the Vehicle Research and Test Center (VRTC) on school bus mirror performance ("Ergonomic Research on School Bus Cross View Mirror Systems" DOT-HS-807-676, 1990), the agency published a Notice of Proposed Rulemaking (NPRM) in the

56 FR. 1991. The agency had two primary objectives in publishing the NPRM: (1) To improve the capability of school bus drivers to see specified critical areas in front of and alongside of school buses in school bus loading zones, and (2) to propose a performance-oriented standard that would replace the existing requirements that prevented certain new convex cross view mirror designs. The NPRM proposed specific performance requirements to Standard No. 111 to ensure that a seated school bus driver could see, either directly or through mirrors, certain specified areas in front of and alongside of a school bus. The proposal specified certain criteria for convex cross view mirrors and proposed establishing test conditions to ensure that the image of an object in a mirror had sufficient clarity. The NPRM also announced the agency's decision not to proceed further with rulemaking to require school buses to be equipped with other devices such as crossing control arms, sensors, or video monitors.

The agency received comments in response to the NPRM from State and local organizations, school bus manufacturers, equipment manufacturers and suppliers, associations, and other organizations. The commenters generally supported the proposal but provided suggested modifications to various portions of it. The agency has considered all the comments in developing the final rule. The commenters' significant points are addressed below, along with the agency's response.

III. Agency Decision

A. General Considerations

Based on the docket comments and other available information, NHTSA has decided to amend Standard No. 111 with respect to the field-of-view around school buses. This final rule amends the standard to require a bus driver to be able to see, either directly or through

mirrors, certain specified areas in front of and along both sides of school buses; to specify certain criteria for convex cross view mirrors; and to establish test conditions designed to ensure that the image of an object is sufficiently clear. Standard No. 111 is also amended to include detailed test procedures to ensure that a school bus provides adequate field-of-view around a stopped school bus, thus reducing the risk of school buses striking student pedestrians.

Among the issues addressed in this notice are the field-of-view performance requirements; the placement and characteristics of cylinders representing the field-of-view requirements; school bus mirror systems including both flat driving mirrors and convex cross view mirrors; specific concerns about convex cross view mirrors including accommodation distance, discontinuities in the surface's slope, adjustment, image quality, and labeling information about their proper use; testing procedures; and the rulemaking's anticipated costs and effective date.

While the final rule essentially adopts the provisions proposed in the NPRM, the final rule does contain several changes as compared to the proposal. Among the more important changes are that the field-of-view requirements include the area near the rear left side of the bus, that the test procedure specifies the stop signal arm be in the retracted position and the front entry door be closed during the testing, that determining the minimum radius of curvature of a mirror be based solely on the distance from the driver's eye location to the mirror surface, that the message about the convex mirror be placed inside the vehicle and be expanded to be more informative, and that testing is allowed at any point within a specified area forward of the 25th percentile adult female driver's eye location, instead of four specific points relative to the eye location.

B. Field-of-view requirements

As explained above, Standard No. 111 currently specifies that each school bus must have an outside rearview mirror of unit magnification (i.e., a flat mirror) on both sides of the bus that "provides the driver a view to the rear along both sides of the vehicle * * *". In addition, each school bus, except for forward control vehicles, must have one convex cross view mirror that complies with detailed specifications and "provide(s) the driver a view of the front bumper and the area in front of the bus."

The NPRM proposed requiring that a school bus driver be able to see, directly or through mirrors, test cylinders

representing students in critical areas around the school bus. To effectuate this goal, each school bus would be required to have mirror systems on both the left and right sides of the school bus—a set of driving mirrors to view the sides of the bus and areas to the rear of the bus, and a set of convex cross view mirrors to see specified areas at the left front corner of the bus, in front of the bus, and along the right side of the bus. Areas viewable along the bus's right side via the two mirror systems would be required to overlap, as would the areas visible along the bus's left side. Along each side, the driver would be provided with a view of the ground from the front bumper forward, along the sides of the bus, and extending at least 200 feet rearward from the mirror. The NPRM proposed that the driver must be able to see the entire top surface of the cylinders placed at critical locations around the bus. Compared to the current requirements for school bus mirrors, the proposed field-of-view requirements would extend the areas which must be visible, provide field-of-view requirements applicable to any school bus configuration, and provide greater objectivity. The NPRM asked whether the proposed field-of-view requirements, as expressed through the placement of cylinders, would reasonably represent the locations at which school bus pedestrians need to be seen by the driver during school bus loading and unloading.

With respect to the field-of-view approach, the commenters, including the National School Transportation Association (NSTA), Mirror Lite, DOT, and the National Highway Traffic Safety Administration (NHTSA) believed that this approach was appropriate. No commenter opposed the proposed approach. The commenters commented that the proposal would provide a realistic performance standard for mirrors. Transport believed that there was a need to improve the field-of-view for school bus drivers and to provide an objective measurement method for all mirrors on school buses.

After reviewing the comments, NHTSA concludes that establishing performance-based field-of-view requirements for school bus mirror systems is reasonable and appropriate. Such an approach will reduce the risk of injury to student pedestrians, while affording mirror and school bus manufacturers and users greater flexibility

C. Test Cylinders

1. Cylinder Placement

As for the placement of test cylinders used to represent student pedestrians, the NPRM proposed that they be located at specified locations near the bus's front wheels, front bumper, locations forward of the bus, near the front right and left wheels, and near the rear right wheel. These proposed locations were based on narratives in the NAS report and docket comments, the VRTC report, the

and the of School Transportation. Nevertheless, unlike Ohio's regulation and the National Conference's specification, NHTSA proposed specific locations and test procedures for showing compliance with the requirements. In requesting comments about whether the proposal reasonably represented locations where student pedestrians are struck by school buses, the agency expressly asked whether the area near the left rear wheels poses a safety problem.

While commenters generally supported the proposed locations for the test cylinders, some commenters addressed whether cylinders should be placed at certain additional locations around the school bus.

Several commenters, including the

the

Education

NSTA,

and

that a view down the left side of the bus was important. No commenter stated that a view of the left side of the bus was unnecessary. Mirror Lite cited fatalities in and to support the view that incidents along the bus's left side, although uncommon, do occur. In recommending that the field-of-view be the same for both sides of the bus, Mirror Lite commented that the cost of such a requirement would be the same and that drivers prefer mirrors to be matching on the right and left, rather than having two different fields-of-view.

After reviewing the comments, NHTSA has concluded that the field-of-view on the left side of the bus should be extended back to the ground near the left rear wheel. While the agency acknowledges that children are infrequently struck near the left side of the bus, the agency notes that such incidents do occur. Accordingly, by requiring test cylinders to be placed by the left rear tire, the amendments will increase the likelihood that the new school bus mirror requirements can prevent these incidents as well.

The agency conducted mirror evaluations on both conventional and transit-style school buses indicating that

left side mirror systems designed to meet the proposed field-of-view requirements for the left front corner and the front of the school bus would also be able to provide a view of test cylinders located at least six feet to the left of the left rear wheel without any adjustments to the mirrors. Additionally, based on the agency's review of current mirror systems, the agency anticipates that the mirrors on the left and right side of the bus will be symmetrical (i.e., a mirror designed to view the right side of the bus will also be able to view the left side of the bus when mounted on the left front of the bus). Based on the above, the agency has modified the final requirements to include additional test cylinders located one foot and six feet to the left of the left rear axle.

Although a cylinder located twelve feet to the right of the rear axle on the bus' right side is required to be visible, NHTSA believes that is not necessary to require that a test cylinder located twelve feet to the left of the rear axle be visible. For a school bus on the side of the road in a loading zone, a cylinder located twelve feet to the left of the left side of the bus would represent a student standing a full traffic lane from the bus. The agency believes that it is unlikely that a student would be in such a position when the school bus starts to depart from the loading zone. In localities where school buses stop in a traffic lane, a cylinder located twelve feet from the left side would represent a child on the other side of the street on a two lane street.

During the course of its mirror evaluations, the agency observed that, in some cases, the cylinders at the left rear axle of the school bus were either partially or fully blocked from view by the extended stop signal arm. Visibility depended on the bus body type and the location of the stop signal and the left side cross view mirror. In contrast, the test cylinders were visible when the stop arm was retracted. The agency also noted that the test cylinders at the right rear axle were either partially or fully blocked by the door when an outward-opening front entry door was open. Based on these observations, NHTSA has decided that the test procedure will specify that the stop signal arm be in the retracted position and the front entry door be closed. This procedure recognizes that school bus drivers must close the door, which retracts the stop signal arm, and then view the mirrors to ensure that no students are in danger around the bus before the school bus leaves the loading zone. If the driver attempted to view the areas around the bus before closing the door and

retracting the stop signal arm the stop signal arm would also block the driver's view of the road, thus impairing many driving decisions.

commented that placing test cylinders J, K, and L on a plane one foot away from the bus would be more appropriate than the proposed two foot distance because the two foot location of cylinder L would provide only limited visibility adjacent to the rear wheel. (The agency notes that cylinder L in the is cylinder N in the final rule.)

commented further that a one foot distance from the most outboard edge of the front bumper for cylinders J and K would help ensure adequate visibility near the front wheels. The agency agrees with this comment and has revised the location requirements accordingly.

commented that there were no proposed requirements for the visibility of cylinder M, which is located six feet from the right side of the bus at the rear wheel. (The agency notes that cylinder M in the is cylinder O in the final rule.) That was an oversight in the and a provision about cylinder M is included in the final rule's requirements for mirror System B.

NSTA suggested that a test cylinder be added to the area directly to the rear of the service door. After conducting mirror evaluations, the agency has concluded that locating a test cylinder to the rear of the service entry door would not be necessary since mirror systems that provide a view of cylinders K and L would also provide a view of the rear side of the service entry door.

Transport believed that because it is theoretically possible for blind spots to exist in some areas between cylinders in front of the bus, NHTSA should specify areas whose perimeters would be defined in terms of cylinder locations that must be seen, rather than simply the cylinders themselves. In the course of this rulemaking, agency staff have evaluated a variety of mirror systems on both conventional and transit-style school buses. In all cases where the test cylinders could be seen and identified in a mirror system, the full ground areas around and between the cylinders could be seen. The agency notes that while a blind spot could occur when looking at a single mirror, such blind spots were eliminated when viewing the entire mirror system. Although it might be theoretically possible for a blind spot to exist between test cylinders, the agency believes such situations would be extremely rare.

The Committee on Transportation believed that the requirements in

S9.2 for the System A driving mirrors on the right side of the bus should have a field-of-view that extends twelve feet out from the side of the bus, not just two feet out, to provide the driver with adequate warning time that a pedestrian contact is imminent. The agency notes that the requirements in S9.2 are primarily for the driving mirror system which must include at least one mirror of unit magnification. Such a mirror could not be adjusted to provide a view that included the side of the bus and a point twelve feet out from the rear axle line unless it were unusually large in size. Yet, such a large mirror would create its own large blind spot. The requirements for System B convex cross view mirrors, which are pedestrian detection mirrors, already provide the seated driver with information about individuals that may be as close as twelve feet from the side of the school bus. Accordingly, because the mirror that would be necessary to request would have safety trade-offs and provide redundant performance, NHTSA has decided not to change the proposed requirements for S9.2 in this rule.

2. Cylinder Dimensions

The proposed provisions about the test cylinders used to represent student pedestrians specify that they be one foot high and one foot in diameter and require that their entire top surface be visible. The agency based this proposal on the VRTC report's recommendation that measurements be made near ground level and on accounts in the docket explaining that children struck by school buses were low to the ground. Additionally, narratives in the 1989 NAS report and the mirror requirements from Ohio support the concept of using some sort of three-dimensional representation of a small child. An exception to the one foot requirement would be that the cylinder placed twelve feet to the right of the rear right wheel, would be three feet high and one foot in diameter. The agency believed that this cylinder needed to have such dimensions to evaluate elongation.

Several commenters, including NSTA, supported the proposal to require the driver to view the cylinder's entire top. NSTA commented that this requirement would help ensure that the driver is provided with a complete enough image to enable the driver to identify student pedestrians in the mirror. After evaluating new generation mirrors and some older mirrors which they consider to be "marginal," It determined that only the new mirrors

could meet the cylinder viewing requirements. This led Thomas Built to conclude that viewing the top of the cylinders is a satisfactory requirement.

A few commenters were concerned that the proposed test cylinder was not adequate for ensuring that all of the critical areas of the ground would be visible. ^{Public} believed that by focusing on the cylinder's top, the proposed visibility test may be inadequate because it ignores contact at the ground level. Lo-Mar and Blue Bird believed that the view of the ground is not ensured through the use of one foot high cylinders. Accordingly, these commenters recommended that cylinders be replaced with one foot diameter flat discs.

After considering the comments about test object's dimensions, NHTSA has concluded that one foot tall cylinders better represent real-world situations than flat discs. In the majority of loading zone incidents, children struck and killed by school buses were either standing or bending over, according to the ^{Public} of Transportation's "1989 School Bus Loading & Unloading Survey." Therefore, the agency believes that most students who are struck by a school bus are at least one foot above the ground. Even children who have fallen are above ground level because their body thickness at their head or torso is at least six inches. If children have fallen, the agency expects that they will be attempting to get back up, which also adds height. The agency's mirror system evaluations further indicate that a three dimensional object such as the one foot tall test cylinder more accurately represents real-world situations than a flat disc. In addition, the cylinder facilitates testing by providing a more practicable means for demonstrating the ability of mirrors to view areas around the outside of the bus. The three dimensional cylinder also makes the relative image quality easier to ascertain.

Mirror Lite commented that the cylinders should be of a readily available design to facilitate testing and to avoid discouraging manufacturers from conducting the test. This view led Mirror Lite to recommend using bright orange 18" traffic cones.

^{Public} requested that along with establishing a requirement for the manufacture of new buses and equipment, the standard should also provide an ongoing performance standard for the end user (e.g., mechanics and bus drivers). Similarly, ^{Public} Schools explained that they were

interested in incorporating the test cylinder grid into its training program.

As for Mirror Lite's comment about an 18" traffic cone, NHTSA believes that such a device is too tall to represent a child who may be bending over or has fallen down. The agency nevertheless agrees with Mirror Lite that having a readily available test object will assist States and local school districts in evaluating mirrors and training school bus drivers. The agency believes that the one foot cylinder is a reasonable size and shape that should be easy to obtain or fabricate. The agency also notes that the one foot test cylinder is only required for compliance test purposes, and that anyone desiring to build a test lane can substitute another test object when conducting evaluations or training.

While generally supporting the performance requirements for mirror System B, Blue Bird recommended an alternative requirement which defined the bounds of specific geometric areas on the ground outside the school bus which would have to be seen. Among Blue Bird's criticisms of the proposal were the use of a cylinder rather than a disc, the need to reduce the distance between the test cylinders and the bus to one foot, the need to include cylinder M in the performance requirements, and the need to include visibility requirements for the left side of the bus. Since all of these items have been addressed above and all but the use of a disc were adopted, the agency does not believe Blue Bird's recommended alternative is necessary.

3. Cylinder Color

The NPRM proposed that the test cylinders be a color which provides a high contrast with the surface on which the bus is parked. According to the VRTC report, such a contrast would facilitate compliance testing. While the proposal did not specify a particular color, the agency requested comments about what color would provide a high contrast with the ground and whether a given color should be specified.

Several commenters addressed the appropriate color and design of the test objects. NSTA suggested that rather than having a high contrast color, the cylinder should be a color that blends into the surroundings, believing that visibility becomes a problem when a child blends in with the surroundings (e.g., the bus itself, pavement).

^{Public} favored replacing the cylinders with two dimensional cutouts of children and adults with colors that are representative of clothes typically used by school children or adults.

Other commenters believed that the test cylinder should be a bright color. Mirror Lite recommended using bright orange traffic cones. Thomas Built explained that its mirror tests are conducted using bright colored cylinders, e.g., safety orange sides with lime green tops and black letters. Research recommended that to make the test procedure less vague, the color of the test cylinders should "be specified either quantitatively (i.e., the percent contrast) or qualitatively by specifying the color of the cylinders."

After reviewing the comments and its own mirror evaluations, NHTSA has decided that the test cylinder must provide a high contrast with the surface on which the bus is parked. The agency believes that having such a high contrast will facilitate compliance testing. Nevertheless, the agency has determined that it would be inappropriate and unnecessary to specify a given color for the test cylinder. The agency has no information to suggest that one color would be more appropriate for a test cylinder than any other color. The agency believes that specifying a single color would complicate the standard without providing any significant corresponding benefits.

D. School Bus Mirror Systems

1. General

Standard No. 111 currently requires school buses to be equipped with two types of mirror systems: (1) An outside rearview mirror of unit magnification ("flat mirror") of not less than 50 square inches of reflective surface on each side of the bus; and (2) one convex cross view mirror. In practice, buses are equipped with a flat driving mirror on each side of the bus, two or more convex cross view mirrors, and typically at least one supplemental convex mirror mounted near each flat mirror and designed to serve as an additional driving mirror. Convex driving mirrors are typically about four inches in diameter and have a radius of curvature (ROC) greater than 35 inches. These larger radii of curvature mirrors have much greater image clarity than the convex cross view mirrors mounted on the front of the bus and therefore can safely be used as driving mirrors. All mirror systems are used by drivers to see students in the loading zone around buses, although the flat mirrors and the supplemental convex driving mirrors are primarily designed to serve as driving mirrors.

The NPRM proposed to modify the current requirements for both types of mirror systems so that each school bus

would be equipped with two mirror systems on each side of the bus: (1) A system that includes flat driving mirrors of unit magnification and optional convex driving mirrors (designated as "System A") and (2) a system that consists of convex cross view mirrors for student detection during loading and unloading (designated as "System B"). The areas viewable along both sides of the bus via the two mirror systems would be required to overlap on each side, providing the driver with a view of the ground in front of and along both sides of the bus and extending at least 200 feet rearward from the driving mirror. Because the agency recognized that most current driving mirror systems on school buses consist of both a flat mirror and a convex mirror, the NPRM included language that "one or more mirrors" could be used to meet the requirements of S9.2 for System A mirrors.

2. Driving Mirrors—System A Mirrors

As for System A mirrors, the NPRM proposed making the current requirements for such mirror systems more objective and expanding the field-of-view to include a larger area. Specifically, the NPRM proposed amending section S9.2 to require that the driver have a view at least 200 feet to the rear and at least two feet to the right of the right side of the bus. The NPRM explained that the proposed requirements reflect the findings of the

School Transportation and accounts in the NAS report and docket that a significant number of incidents occur by the right rear wheels of school buses.

In responding to the NPRM's proposal about System A mirror systems, several commenters, including Mirror Lite, Thomas Built, Transport and Blue Bird, appear to have misunderstood the proposed requirements of S9.2. Based on their comments, it appears that they believe the system's flat mirror portion by itself would have to comply with the requirement that the view of the "area of the ground which extends rearward from the mirror surface (must be) not less than 200 feet." The agency wishes to clarify that the flat mirror by itself need not comply with S9.2. The proposed requirements were for a "mirror system" (emphasis added) which could include both a flat mirror and a convex mirror. Accordingly, to comply with S9.2, it is permissible for the convex portion of the mirror system to provide some portions of the required field-of-view.

The agency believes that it is unnecessary to expressly require the

installation of a convex mirror for the driving mirror system. Since the proposed revisions to Standard No. 111 are performance-oriented, not design-oriented, manufacturers can choose whatever mirror system they believe is best. Avoiding unnecessary restrictions facilitates the introduction of future technological improvements in mirror systems.

Blue Bird suggested modifying S9.2(c) by establishing specified zones along both sides of the bus which would have to be viewable to the seated driver. As explained in the section on test cylinders, the agency believes that establishing field-of-view requirements through test cylinders at specific locations around a school bus provides a more realistic simulation of real-world school bus operations than establishing geometric zones.

Blue Bird also commented that establishing minimum permissible radii for convex mirrors used in proposed mirror System A could be detrimental to the performance requirements being proposed. The agency notes that neither the NPRM nor the final rule included provisions about minimum radii of curvature for System A mirrors. The same is true for System B mirrors.

3. Convex cross view mirrors—System B Mirrors

a. General. S9.2(a) of Standard No. 111 currently contains detailed specifications about the characteristics of convex cross view mirrors, including minimum and maximum permissible radii of curvature, minimum surface areas, and restrictions for convex mirrors with non-uniform radii. The current standard only requires one convex cross view mirror.

The NPRM proposed that a cross view mirror system (System B) be provided on both sides of a school bus to ensure that seated drivers have a complete view of all critical areas in front of and along both sides of the bus that are not within their direct field-of-view. The NPRM also included a requirement that "[T]he view of the ground provided at the driver's eye location by system B shall overlap with the view of the ground provided by system A." The agency proposed to delete the current specifications for convex mirrors, believing that this action would permit States and local school districts to use a wider variety of mirrors.

The NPRM addressed several subissues about convex cross view mirror characteristics, including accommodation distance (i.e., the distance at which people can focus on images in mirrors), discontinuities in the mirror surface's slope, adjustment,

informational labeling, and image quality.

In addition to general questions about convex cross view mirrors, the agency specifically asked about whether a minimum permissible radius of curvature should be specified, whether convex cross view mirrors should be used for driving purposes, and whether the upper portion of convex mirrors should be cut off or blackened out to reduce the amount of glare reflected into the driver's eye.

All commenters supported using convex cross view mirrors to view areas outside of school buses. Commenters also addressed specific points about particular mirror systems. Mirror Lite believed that wide-angle cross view mirrors are better than multiple conventional mirrors because having multiple mirrors would result in confusion as to which mirror is showing what image.

Several commenters, including DOE, DOT, and Blue Bird, believed that in practice, convex cross view mirrors are used for driving purposes. Thomas Built and Blue Bird commented that certain convex cross view mirrors should not be used as driving mirrors. These comments are addressed later in this preamble in the section discussing an instructional message for the proper use of convex cross view mirrors.

Several commenters responded to the agency's question in the NPRM about cutting off or blackening out the cross view mirror's upper portion. The

DOT opposed cutting off or blackening out any portion of the convex cross view mirror, believing that all portions of the mirror provide some benefit if properly adjusted and used. In contrast, DOE, Blue Bird, and the

DOE, Blue Bird, and the DOT believed that the top portions of convex cross view mirrors serve no useful purpose and should be eliminated. Research stated that the "market place has determined the upper portion of the mirror is of no value and may be a distraction to the driver."

Notwithstanding the comments favoring the elimination of the top portion of convex cross view mirrors, NHTSA believes that there is no conclusive information to support this approach. Additionally, there is no information available for determining what specific areas of mirrors should be cut off or blackened out. This type of requirement would also make the standard more design restrictive than the agency believes is desirable. In addition, Blue Bird claims that the "marketplace" has determined the need for blackening out such mirrors does not

appear to be accurate, since several convex mirrors without blacked-out areas are apparently being successfully sold in the marketplace. However, if certain mirror areas are found to be inefficient, then the agency anticipates that the marketplace will make judgments on the efficacy of various mirror systems and that those judgments will be reflected in future mirror designs. Since no information was produced to suggest that the upper portions of cross view mirrors were dangerous to a driver's view of pedestrians, the agency has decided not to establish limitations on the field-of-view coverage provided by a cross view mirror. The agency believes that individual State and local school districts are capable of evaluating mirror systems that meet these standards and selecting those which best meet their needs, including, if they so chose, mirrors from which the top portions have been eliminated.

b. *Accommodation distances.* The proposed a new provision that would require that the distance from the center of each convex cross view mirror to the center point of the driver's eye location, plus one-half the smallest radius of curvature of the mirror surface be at least 39 inches. The agency based this proposal on the DOT report's finding about accommodation distances, i.e., the finding that older people have greater difficulty focusing on nearby objects, especially in convex mirrors with small radii of curvature. According to the DOT report, if the distance between the driver and the image in the mirror is less than 40 inches, drivers over 40 years old may see a blurred image.

Several commenters supported the 39 inch accommodation distance, believing that such a requirement is feasible.

Blue Bird, and Research, along with NSTA, questioned whether transit type school buses could be equipped to comply with the 39 inch requirement. Neither NSTA nor Research provided any specific information to support their concerns about transit buses.

Blue Bird disagreed with the 39 inch requirement, stating that it would be difficult to measure accurately and might hinder mirror performance and innovations. Blue Bird opposed having restrictions on the mirror's location, claiming that the agency does not restrict the locations of other bus components such as gauges, switches, and lights.

Based on the available information, including the agency's evaluations of the comments and various mirror systems, NHTSA has decided to adopt the proposed accommodation distance requirement with certain modifications. In evaluating various mirror systems on both conventional and transit-style school buses, NHTSA has found that these mirrors are always capable of complying with the proposed 39 inch requirement of S9.3(b)(2) when mounted at locations consistent with the mirror manufacturers' recommendation. The agency also notes that the concerns expressed by NHTSA and Blue Bird about transit-style school buses not being able to meet such a requirement were not shared by the school bus and mirror manufacturers commenting on this issue, all of whom stated that the requirement could be met. Blue Bird did not claim that the proposed 39 inch requirement could not be met, only that it would be difficult to measure accurately. Also, Blue Bird appears to disagree with the proposed requirement on a philosophical basis, i.e., since NHTSA does not establish restrictions on the location of other components of the bus used during its operation.

In evaluating the proposal, NHTSA has measured the distances from the driver's eye location to the mirror surface on a number of school buses, including transit style buses, and has found it to be a straight-forward task that gets easier the more it is done. The aspect of the measurement that required the most effort was establishing the line of sight through a window and then measuring that line. The use of standard tape measures, one used to measure the distance from the mirror to the window and the other to measure the distance from the window to the eye location, worked well for establishing the line of sight and measuring it. The thickness of the window was then added to the measured distances. A more elaborate test setup could be established using a laser or high intensity light beam to establish the line of sight. Based on the agency's experience in measuring mirror distances, the degree of accuracy is not that critical since all of the mirror distances were well over 39 inches.

However, NHTSA agrees with the commenters that determining the minimum radius of curvature of a mirror may be a difficult and time consuming task. Accordingly, the agency has modified the final requirement so that the eye accommodation distance is based solely on the distance from the driver's eye location to the mirror surface.

The proposed requirements in S9.3(b)(2) have been modified to read as follows in this final rule: "Each mirror shall be located such that the distance from the center point of the eye location of a 25th percentile adult female to the center of the mirror surface shall be at least 37.5 inches." To repeat, the proposed requirement was for the distance from the center of each convex cross view mirror to the center point of the driver's eye, plus one-half the smallest radius of curvature of the mirror surface, to be at least 39 inches. While the proposal's provision about adding "one-half the smallest radius of curvature" to the distance from the driver's eye to the center of the mirror is no longer expressly part of the specified measurement, the agency derived the 37.5 inch distance in this final rule using the proposed combination of distance between the driver's eye and the mirror and one-half the radius of curvature of the mirror.

The 37.5 inch minimum was derived as follows. Of all the mirrors used in the report, the smallest radius of curvature (and thus the one with the poorest image quality) was 3.41 inches. Assuming that the design radius of curvature of future mirrors would not be less than 3 inches, then one-half of that radius of curvature would be 1.5 inches. Subtracting 1.5 inches from the 39 inch proposed requirement leaves 37.5 inches. The final rule accordingly accounts for accommodation distances in worst case situations, just as the proposal did, but simplifies the calculation.

NHTSA disagrees with Blue Bird's comment that mirror location should not be regulated because the location of other components (i.e., gauges, switches, and lights) in the bus are not regulated. The agency believes that to ensure the safety of student pedestrians, the images in school bus mirrors, particularly convex mirrors, cannot be blurred for any driver. That same level of concern is not necessary for clearly seeing a gauge or switch, since seeing such devices is not as critical for student safety as viewing a mirror system. Also the inherent nature of convex mirrors, which reduce the size and elongate the image of the reflected object, make mirror images more difficult to see and use. By contrast, the task of identifying gauges and switches is comparatively straightforward.

DOT commented that school buses should be equipped with forward mount driving mirrors on the left side, in lieu of the low mount driving mirrors currently being used by many districts.

that this requirement "is needed in order for the mirror to be at

least 39" from the driver's eye." NHTSA notes that appears to have misinterpreted the provision's applicability, because the minimum accommodation distance applies only to convex crossview (System B) mirrors, not to driving (System A) mirrors. Although the comment is related to driving mirrors, instead of the cross view mirrors, it illustrates that different cross view mirror mounting locations may be necessary on some types of school buses to meet the accommodation distance requirement.

c. *Discontinuities in a mirror surface's slope.* Standard No. 111 currently prohibits discontinuities in a mirror surface's slope. The NPRM proposed retaining this requirement, but redesignating it S9.3(b)(3). The proposal explained that prohibiting mirror discontinuities would prevent mirrors in which the slope or surface of the mirror was concave, thus protecting against poor image clarity.

All those commenting on this issue, i.e., NSTA, Thomas Built Buses, and agreed that retaining the current prohibition on mirror discontinuities is necessary. Accordingly, the final rule adopts this provision.

suggested that the agency use the term "diminishing image" instead of "distortion" to describe the image quality provided by cross view mirrors. It stated that distortion is a flaw in the mirror surface that can be found in any type of mirror. After reviewing the comment, the agency agrees with and has decided to use the phrase "image clarity" rather than "distortion" in the preamble. Nevertheless, the agency notes that this term is not in the regulatory test.

d. *Mirror supports and adjustment.* Standard No. 111 currently requires each flat mirror and each convex cross view mirror to be installed with a stable support. The proposed that each convex cross view mirror "be installed with a stable support designed to dampen vibration." This requirement is intended to ensure a clear and properly focused image by preventing mirrors from vibrating unreasonably and by reducing the likelihood that mirrors become misaligned. Comments to the explained that such

misalignment reduces a driver's ability to see children in potentially dangerous locations around a stopped school bus.

The asked the following questions about mirror stability:

(1) Could the requirements be made more precise?

(2) Is it necessary to require adjustable mounting brackets for all types of cross view mirrors?; and

(3) Do non-adjustable brackets reduce the amount of vibration of the mirror while driving or idling?

Commenters disagreed about the need for requiring mirrors to have stable supports. NSTA and Thomas Built believed such requirements were not needed, with Thomas Built stating that most current mirror mounting systems provide a stable yet easily adjustable mirror system. In contrast,

supported the proposal to require stable supports.

supported an objective test to evaluate the stability of mirror brackets for cross view mirrors but had no particular recommendations to increase the requirement's precision.

supported the proposed regulatory language, agreeing that vibration can significantly harm image quality. Nevertheless,

suggested that additional language be included stating that if a mirror adjustment mechanism is necessary, it should be designed so that vibrations would not misalign the mirror.

explained that its draft State mirror requirements would specify that cross view mirrors "shall be easily adjustable but be rigidly braced to reduce vibration."

Commenters discussed the types of mirror adjustment mechanisms currently being used. Some mirror systems have both adjustable brackets and mirrors, some only have adjustable mirror portions, and others only have adjustable brackets.

and believed that mirrors should be adjustable.

and Blue Bird believed that mirrors should have adjustable brackets. Blue Bird commented that properly tightened adjustable brackets become rigid and thus perform the same function as non-adjustable brackets.

After considering the commenters' varying views, NHTSA has determined that Standard No. 111's existing requirements for mirror stability are appropriate, and they are adopted in this rule. The agency recognizes that different mirror manufacturers have developed various types of mounting brackets and mirror mountings that employ different degrees of adjustability or non-adjustability. There is no evidence in the comments to the docket, or in any of the mirror evaluations the agency has conducted, that the proposed requirements could be made any more precise. NHTSA notes that Standard No. 111 currently requires "stable support" for both inside and outside mirrors on all types of vehicles, not just school buses. The agency believes that these requirements should be retained for school buses. While a

more precise requirement is not possible, the agency believes it is important to retain a requirement for mirror stability in the standard as a means of highlighting the importance of mirror stability to mirror performance.

One change from the proposal is prompted by Transport comment that the stability requirements should also apply to the System A mirrors. As Standard No. 111's existing requirements for school bus outside rearview mirrors include "stable supports." The agency agrees that the stability requirements should continue to apply to System A mirrors, and the final rule's requirements have been modified accordingly.

Additionally, NHTSA notes that on 1991, it revised Guideline #17 to state "that all school buses shall have a system of mirrors that conforms to the school bus requirements of FMVSS No. 111." (56 FR 19270) While this amendment means that the most current requirements in Standard No. 111 are applicable, the agency has decided to issue elsewhere in today's

a conforming amendment to clarify this situation. In particular, the conforming amendment deletes the outdated requirements referring to the 30 inch rod test in Guideline #17.

e. *Informational label on using cross view mirrors for driving purposes.* The agency discussed the concern about using convex cross view mirrors as driving mirrors. These concerns were based on the agency's belief that the inherently poor image clarity and image size reduction characteristics of highly convex mirrors make such mirrors inappropriate for driving purposes. In addition, the reaction time is slower for drivers using several mirror systems each with significantly different radii of curvature. Such mirrors may not provide the driver with a consistent reference point with respect to the location of images in the various mirrors. Accordingly, the agency proposed that mirrors with an average radius of curvature less than 35 inches be marked with the following message:

"THIS MIRROR IS NOT DESIGNED FOR USE WHILE THE VEHICLE IS IN MOTION."

The agency identified three issues about these informational requirements: (1) The need for such a message; (2) the message's content; and (3) the message's location. As to location, the agency proposed that the message be placed directly on the mirror, but requested comments about other possible locations.

Regarding the need for an informational message on convex cross

view mirrors, only NSTA and Thomas Built Buses believed that a message was unnecessary. NSTA stated that the message could impair the mirror's effectiveness and distract the driver. NSTA and Thomas Built said that the message was unnecessary because they believed that driver training would be more effective than a label whose benefits were questionable.

All other commenters supported having an informational label either expressly

and
or implicitly (Transport
Schools,

Lo-Mar, and Blue Bird) by not objecting to the label, while commenting on the location, size, or wording of the warning.

commenters stated that an informational label was necessary because in practice drivers use cross view mirror systems to gain information on traffic conditions around the bus.

After considering the comments, NHTSA has determined that a message explaining the proper use of convex cross view mirrors is necessary since some drivers use these mirrors for driving purposes. The agency is aware that properly trained drivers will have been taught that these mirrors are for pedestrian detection purposes only. Accordingly, NHTSA believes that the label will serve more as a reminder message rather than as an "instructional" message for those drivers trained in the proper operation of school buses and use of mirror systems. The agency believes that the message will also benefit untrained drivers, by informing them about the mirror system's proper use.

As to the content of the message, commenters commented that the label should communicate two things: the correct action required of drivers, and the potential consequences of inappropriate behavior. NHTSA agrees with comment that a more positive, informative message would provide greater potential safety benefits than the proposed one. Specifically, the message adopted in the final rule explains what action should be taken (i.e., use the mirror to detect pedestrians), what action should not be taken (i.e., do not use the mirror to view traffic), and why the mirror should not be used inappropriately (i.e., the images do not accurately show another vehicle's location). Accordingly, the message required by the final rule has been changed to read as follows:

"USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING. IMAGES

IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION."

Many commenters addressed the proper location for an informational message about cross view mirrors. Only commenters favored placing the message on the mirror itself, claiming that placing this message elsewhere inside or outside the bus would create problems since many buses already are required to contain several messages.

All other commenters, including Research,

and commenters recommended that the message be placed inside the school bus near the driver instead of on the cross view mirror itself. Commenters stated that a message placed directly on the mirror would be difficult to read and would obstruct some images, thus adversely affecting mirror performance.

commenters stated that the message should be placed on or near the instrument panel.

commenters favored including the message on a sticker attached to the bus in the line of sight of the driver when observing the mirror. commenters favored placing the message inside the bus either on the instrument panel or near the interior rear view mirror.

After considering the above comments, NHTSA has decided that the message should be located inside the school bus near the bus driver instead of on the convex cross view mirror. The agency agrees with the comments that a message placed directly on the mirror would be difficult to see and would reduce mirror performance by obscuring some mirror images. As noted above, the agency's primary goal is for drivers to understand that these mirrors should not be used while the vehicle is in motion because information obtained in such situations is not accurate enough to make appropriate driving decisions.

The agency agrees with

commenters that the driver's area already contains a number of informational labels explaining proper school bus operations. Since the agency is unaware of any single "best" location for the mirror-use label, the final rule provides flexibility to bus manufacturers in placing the label at an appropriate location which is prominent and visible within the driver's area of the bus. The standard requires the label to be printed in type face and color that are clear and conspicuous. NHTSA notes that these locations, size, and color requirements are patterned after the warning label requirements for utility vehicles in 49 CFR 575.105.

f. *Performance requirements for image clarity.* The proposed performance requirements to ensure that the images in cross view mirrors were of sufficient minimum quality to provide the school bus driver with reliable information about the presence of children in front of and along both sides of the bus. In selecting these proposed requirements, the agency relied on the report's finding that only a limited level of image quality is necessary to ensure that a school bus driver is aware of a student in a dangerous zone, so as not to move the bus until the student has moved to a safe location.

The proposed two requirements to ensure adequate image quality. First, the separation between the edge of each cylinder's image and the edge of the effective mirror surface would have to be not less than 3.0 minutes of arc. This requirement stems from the agency's finding that the most difficult images to recognize are elongated ones near the mirror's curved reflective edge. Second, with respect to the image of the cylinder perpendicular to and twelve feet away from the rear right axle, the angular size of the longest dimension of that image would have to be not less than nine minutes of arc and the angular size of its shortest dimension would have to be not less than three minutes of arc. This requirement stems from the agency's finding that unreasonable elongation would make it difficult for the driver to identify a child's image in the mirror.

Several commenters addressed the issue of image quality. believed that a test procedure was necessary to reduce distortion due to a flawed mirror surface and to increase image quality. NSTA stated that only a reasonable level of image quality is necessary, since a driver needs only to recognize that an object in the mirror is a child and does not need to know specific details about the image. Thomas Built commented that the specification for the minimum distance between the image and the mirror's effective edge could be eliminated, believing that the elongation requirements of S9.4(b) (1) and (2) should make the image "acceptable."

Commenters also provided general comments about the image quality requirements. that when a cylinder is visible in two mirrors, both images should have to meet the requirements for minimum size and distance from the mirror's edge, believing that this would ensure that a small child would not be overlooked. While agreed that the location of the image relative to the outer edge

of the mirror surface should be limited. it believed that the proposed requirement of three minutes of arc would be difficult to measure given its dependence on the following variables:

(1) The radius of effective mirror surface, (2) mirror adjustment by the driver, and (3) distance from the driver's eye location to the image in the mirror for different mirror combinations and bus types on which mirrors are mounted. Blue Bird was concerned that this proposal would result in ambiguities given potential problems in accurately measuring the allowed mirror distance between the image and edge of the mirror. Blue Bird recommended establishing a limit on the distance between images and the mirror edge which it characterized as being more easily measurable during compliance testing.

Several commenters provided specific suggestions about changing the requirements for image quality. Thomas Built recommended that each cylinder's top surface have a letter which would be used to evaluate image clarity. Thomas Built believed that the proposed three minutes of arc was "minute and undeterminable," stating that on a mirror with a 28 inch radius of curvature, three minutes of arc is only .024 inches. Accordingly, suggested the requirement be eliminated unless a fixed dimension such as $\frac{1}{16}$ inch is specified. Similarly, suggested establishing a fixed distance of $\frac{1}{16}$ inch along the effective mirror surface's edge to be blocked out during compliance testing.

After reviewing the comments, NHTSA repeated several mirror evaluations and created charts representing a distance of three and nine minutes of arc for use in the proposed test procedure. (See Figure 4.) Based on that evaluation's results, the agency believes that three minutes of arc can be accurately measured and that this dimension provides adequate separation between the test cylinders and the effective edge of the mirror. Accordingly, the final rule adopts the proposed three minutes of arc requirement.

As for suggestion to letter the tops of the cylinders, NHTSA notes that the report found that such precision is not necessary for the driver to recognize that a pedestrian is in danger. In addition, such a high level of precision might be impracticable for certain mirrors that nonetheless provide an adequate field-of-view. Similarly, the agency believes that adopting Transport recommendation for multiple images of the same cylinder to comply with the image clarity requirements

would be unnecessary for safety and would be redundant. Moreover, such a requirement appears to be impracticable based on the agency's evaluation of various mirror systems.

As for the suggestions by and to establish a minimum fixed dimension of either $\frac{1}{16}$ or $\frac{1}{4}$ inch between the test cylinder image and the mirror's effective edge, NHTSA believes such an approach would be neither practicable nor appropriate. NHTSA notes that the "effective edge" of a convex mirror varies depending on the adjustment of the mirror and the driver's eye location. Accordingly, it is not feasible to specify a measurement from a variable location since the effective edge of a convex cross view mirror is often towards the center of the mirror, instead of at the actual edge of the mirror.

g. *Image elongation.* As noted above, the proposed language controlling the minimum angular size of the image of the test cylinder located twelve feet perpendicular to the side of the bus at the right rear axle line. The purpose of this proposal was to ensure that the image would not appear unreasonably elongated, a phenomenon that might prevent drivers from being able to identify a child's image in the mirror. As noted in the report and in the agency's in-house evaluation, drivers have the most difficulty seeing images of objects along the axis perpendicular to the right rear wheel because some current designs of convex cross view mirrors unreasonably elongate the image.

Several commenters expressed their views about the elongation requirement. stated that the proposed minimum image sizes of three minutes and nine minutes of arc would be adequate as a minimum standard for most situations. Nevertheless, it believed that occasionally a driver with poor vision in low contrast situations would not be able to detect objects in a mirror designed to comply with the proposed minimum image size requirements.

objected to the proposed elongation requirements, claiming not to understand the use of cylinder N to measure distortion. believed that the agency did not justify the specified angular dimensions for a distorted image viewed in any particular mirror, arguing that the proposed angular sizes may be too restrictive and may not correspond to real-world situations. In support of its argument, Blue Bird cited the report which stated that "It is better to have a 'distorted' object in the mirror than no object at all." Based on the above, Blue

Bird requested that the agency conduct additional research to determine practical real-world limits for allowable image distortion.

Commenters also offered specific recommendations about the performance requirements for elongation. suggested that the final rule contain either a table of target dimensions that subtend the three and nine minute visual angles when viewed at a specified distance or contain the mathematical formulae to calculate them. requested that "angular size" be better defined, claiming that the angular size of the cylinder's image in the mirror is confusing. Nevertheless, offered no specific suggestions.

suggested that the image size requirements be extended to all cylinders in all mirrors, stating that cylinder N will not necessarily appear in the mirror at the mirror's smallest radius of curvature. also suggested that the minimum angular size for cylinders A through F be five minutes of arc, and the minimum angular size for cylinders G through K be ten minutes of arc.

After reviewing the comments and conducting additional mirror evaluations, NHTSA has decided to adopt the proposed requirements for minimum angular dimensions of test cylinder N in this final rule. The agency notes that the test cylinder identified as N in the is identified as cylinder P in this final rule. The agency believes that the elongation requirements are necessary to protect against poor image quality for objects toward the rear of the bus.

In response to the comments from and

the agency notes that test cylinder P will most often be located further towards the edge of the effective mirror surface than the other test cylinders. Therefore, cylinder P's image will typically be a worst-case image that is subjected to more spherical aberration than other images that are further from the effective edge of the mirror. Because of this, the image of cylinder P will typically be the least clear. This fact, combined with test cylinder P being located the farthest away from the mirror and driver, indicates that controlling the image clarity of test cylinder P should effectively control the image clarity of all test cylinders.

NHTSA believes that the minimum angular sizes (three minutes and nine minutes) adopted here in the elongation requirements are consistent with the dimensions adopted in the image clarity requirements for the distance from test cylinders to the effective edge of the

mirror (three minutes). Both sets of dimensions were based on NHTSA mirror evaluations and the capabilities of these existing mirrors to meet those dimensional limits. While real-world evidence to define conclusively the optimum image sizes is not available, and may be impossible to obtain because of the many factors influencing the clarity of an image in a cross view mirror, the agency believes the adopted image clarity and elongation requirements are reasonable and practicable. Aside from the objections by and no other comments were received on this subject. The agency assumes that the other commenters tacitly approved the image clarity and elongation requirements since the expressly asked about the reasonableness and practicability of these requirements, a subject about which the commenters are generally knowledgeable.

After reviewing comment about including a comparison chart and the mathematical formula, the agency has decided to modify the final rule to incorporate a size chart for three minutes and nine minutes of arc and the formulae for calculating them.

E. Testing procedures

1. General

Based on the report and other agency findings, the agency proposed in section S13 certain test procedures under which the proposed performance requirements would be evaluated. As explained below, the proposed detailed specifications about the characteristics of test cylinders and their placement at critical locations in front of and along both sides of the school bus. The also proposed a testing reference point and testing procedures, including the photographing of test cylinders.

2. Testing Reference Point 25th Percentile Female

The proposed that compliance testing be measured relative to the center point of the eye location of a 25th percentile adult female represented by a two dimensional manikin. The agency selected this sized driver because such a driver tends to have a poorer direct field-of-view of the area near the bus than a taller (e.g., 95th male percentile) driver.

The proposed regulatory text in S13.2 contained specific information on determining the eye location of a 25th percentile adult female seated in the driver's seat. These provisions concerned the seat's position and adjustment procedures.

Several commenters addressed the testing requirements related to the driver position. believed that the standard need not refer to the 25th percentile female since precise dimensions from the seat are provided.

disagreed with the use of a 25th percentile female for identifying the eye location, stating that for passenger cars, Standard No. 111 uses a driver's eye location corresponding to a 95th percentile male. Notwithstanding its criticisms, acknowledged that the proposed eye location procedures would allow precise determination of the driver's eye location in any bus. believed that multiple eye locations should be used in the test procedure, including a 5th percentile female and a 95th percentile male. It stated that the 95th percentile male provides the worst-case viewing in indirect field-of-view situations since that type of driver sits farthest from the mirrors.

After reviewing the comments, the agency continues to believe that the eye location of the 25th percentile adult female is appropriate for representing a "worst case" for visibility. Therefore, the proposed requirements are adopted in this final rule. The agency notes that because the adopted requirements consider the bus's entire field-of-view and not just the indirect view created by mirrors, the 25th percentile female provides a more stringent testing perspective than a 95th percentile male. This consideration outweighs the perceived benefits from having consistent reference points in Standard No. 111 for all the different types of vehicles.

The agency believes that Transport suggestion that eye locations be based on 95th percentile males and 5th percentile females would create excessive requirements. As discussed below in the section on "Camera Testing Points," the final rule allows for compliance within an area formed by the points of an arc located six inches to the left, forward, and right of the eye location of a 25th percentile adult female. Such a requirement recognizes that drivers typically move their heads while viewing mirrors, and that the range of these movements would encompass eye locations for various size drivers.

As stated, the final rule provides dimensional information for locating the center point of the driver's eye location. Even though it may not be strictly necessary to do so, the agency believes that the rule should expressly state that the source of that dimensional information is the 25th percentile adult female.

3. Mirror Adjustment During Testing

The proposed that the mirrors be adjusted in accordance with the manufacturer's recommendations (see S13.3). Several commenters addressed the issue of mirror adjustment.

and that the agency should modify proposed S13.3 in the final rule to state that, once adjusted, the mirrors must remain fixed in one position throughout the measurement procedure. On the other hand, commented that mirrors subject to Standard No. 111 should be remotely adjustable from the driver's seat to accommodate the eye locations of different size drivers.

After reviewing the comments, NHTSA has decided to modify the language in S13.3 to prohibit moving or adjusting mirrors during compliance testing. The agency's intention in the was to require mirrors that would, once properly adjusted, afford the driver a clear view of children present around stopped school buses. Mirrors that must be repeatedly adjusted to view the entire area around the stopped bus would not effectuate that intention. In addition, mirrors that must be repeatedly adjusted are not likely to be adjusted every time by the driver, which would mean there potentially could still be situations where the driver could not detect child pedestrians around the stopped school bus. To ensure that the mirrors required by this final rule will not need any further adjustments after the initial one, this rule modifies the proposed language in S13.3 to make such a requirement explicit.

This rule has not been modified in response to comment about remotely adjustable mirrors. As explained above, the agency is seeking to require mirrors that will offer a clear view of the area around a stopped school bus without any further adjustments after the initial one. While remotely adjustable mirrors are now available, they will not be considered as complying with this rule if they must use their adjustability characteristics to provide the required view during testing.

4. Camera Testing Points

The proposed that observations would be made and photographs taken of the test cylinders from a point representing the center of the driver's eye location for a 25th percentile adult female, as well as at locations six inches forward, left, and right of the center of the driver's eye location. These multiple positions were intended to account for head

movements. Under the proposed test procedures, cylinders that were directly viewable would be evaluated first, and then cylinders that were not directly viewable would be evaluated. In both situations, the evaluator would look through a camera's film plane to determine whether the entire top surface of a test cylinder could be directly seen. A comparison chart placed above each mirror would serve as a reference point in evaluating the image size and amount of distortion of cylinders visible in a mirror.

Many commenters addressed the requirements related to the camera locations. The supported the proposed procedure. According to this commenter, it evaluated some existing mirror systems in accordance with the proposal and determined that the driver's eye location can be established and the camera location is correct.

Other commenters either criticized the proposed camera-related testing procedures or offered suggestions to improve the requirements. was concerned that the camera location requirements would be interpreted differently by various bus manufacturers, but did not explain the basis for its concern.

requested that mirror systems should only have to meet the test requirements from any one of the allowable camera locations instead of all locations, claiming that the time and cost of conducting photographic tests at multiple locations would be unreasonable. In support of its request, stated that the proposed requirement would require it to evaluate 140 bus/driver seat combinations for any given mirror system since certification testing would have to be conducted on each type of bus with each type of driver seat offered. Since estimated that evaluating one seat in one bus with one mirror system required about 80 man hours and \$125 of photographic materials, it viewed the testing necessary to evaluate 140 combinations as being overly burdensome.

criticized using a camera to measure compliance, citing such concerns as the camera's monocular vision, the burden to customers of many photographs and their duplication for documentation purposes, the camera's inability to define correctly the direct field of view, and its inability to consider adjustments made by humans in mirror visibility.

requested that video cameras be allowed, claiming that their use would permit viewing of images superior to those seen by

cameras. It also requested that the requirements provide more detail on the focal length of the camera lens.

After reviewing the comments, NHTSA agrees with that requiring testing at multiple points would be overly burdensome and would not yield significantly more worthwhile information. Upon reexamination, the agency now believes that a more appropriate procedure would be to allow testing to be done at any point within a specified area around the 25th percentile adult female driver's eye location. Such a procedure more accurately accounts for real-world situations in which drivers typically move their heads while they view mirror systems. Based on the above, the agency is changing S13.4 in this final rule to allow compliance with the standard at any one of the four points specified in Figure 3 (point "A," "B," "C," or "D") or at any single point within a semicircular area established by a 15.24 centimeter (6 inch) radius parallel to and forward of the center point. This viewing zone is illustrated in Figure 3. The agency anticipates that this modification will provide meaningful information about the driver's view of critical areas around the bus, while reducing the photographic time and cost factors mentioned by

by 75 percent. The agency believes that if a vehicle manufacturer can establish compliance at one of the four testing points or any point in the semicircle, then that mirror system on that school bus should provide an adequate field-of view given the small size of the semicircle.

NHTSA believes that concerns about a camera's monocular vision and its inability to define the direct field of view are philosophical in nature and relate to the inherent limitations of current technology. Given the available means to demonstrate objectively compliance with this standard, NHTSA is unaware of any other means that would be as effective, as practicable, and as easy to demonstrate as the use of a camera.

As for claim that the camera location specifications were ambiguous, the agency disagrees. NHTSA believes that difficulties in interpretation are unlikely, because the camera location specifications are well defined and easily achieved in actual testing situations.

As for comment about video cameras, NHTSA has determined that this testing method is appropriate and should be permitted. Accordingly, the final rule at S13.4 has been modified. While video technology as a means for demonstrating

compliance with this standard may currently be less practicable than still photography, the agency believes that technological improvements may make video cameras a more viable option in the future. The agency therefore has decided not to preclude their use. To accommodate this modification, the term "film plane" has been changed to "image plane."

As for a lens focal length, the agency does not believe specifications about the focal length of lens are necessary. During the agency's mirror evaluations, lenses of various focal lengths were used to photograph the mirror images, including 50 mm to 250 mm lenses. While the ability to analyze the results was acceptable with all lenses, the agency noted that less enlargement was necessary when using a lens with a longer focal length. The agency believes it is reasonable to allow the entity conducting the test to select the type of camera and lens best suited to its purposes.

F. Miscellaneous Considerations

1. Certification

requested that the mirror manufacturer be responsible for certifying the image's quality and the bus manufacturer be responsible for certifying the field-of-view. It stated that this division of responsibility would simplify the testing and development process between mirror and bus manufacturer.

NHTSA notes that suggested certification scheme would be inconsistent with the scheme set forth in Standard No. 111. That standard is a "vehicle" standard under which the vehicle manufacturer, and not the mirror manufacturer, is responsible for ensuring that a mirror complies with the standard. This ensures that vehicles equipped with noncomplying mirrors will be quickly remedied, without the need for a specific determination of whether the noncompliance arose because of an innate problem with the mirror or because of its installation on these particular vehicles. The agency does not believe there is any reason to change this scheme for school buses under Standard No. 111. Notwithstanding this conclusion, the agency notes that a vehicle manufacturer can establish in its purchase specifications whatever level of requirements it chooses for its suppliers and take appropriate actions if the supplier's products fail to conform to those specifications.

2. Retrofitting

Several commenters, including the and the

advocated that NHTSA require existing school buses to be retrofitted to comply with the new requirements. The stated that the agency's decision not to retrofit existing school buses was "based more on a lack of regulatory courage than legal restrictions."

The agency's statutory authority under the National Traffic and Motor Vehicle Safety Act (the Safety Act; 15 U.S.C. 1381 *et seq.*) is to issue safety standards applicable to new motor vehicles and new items of motor vehicle equipment before their first consumer purchase. The Safety Act expressly provides that vehicles and items of equipment are not required to continue to comply with all applicable safety standards after their first purchase for purposes other than resale. See section 108(b)(1) of the Safety Act (15 U.S.C. 1397(b)(1)). Thus, NHTSA's safety standards regulate the manufacture and sale of new vehicles and items of motor vehicle equipment. Regardless of the agency's "regulatory courage," amendments to the safety standards do not and cannot require vehicles in service to comply with the requirements adopted in final rules.

However, the individual States do have the authority to regulate vehicles in service. Notwithstanding the lack of Federal authority to order school buses already in service to meet these amended requirements, the agency anticipates that many in-use school buses already comply with or will be retrofitted by State and local authorities to comply with these amended requirements.

3. Applying Requirements to Buses Other Than School Buses

recommended the agency apply the new field-of-view requirements to all transit-type vehicles that transport the public.

NHTSA notes that recommendation to apply the field-of-view requirements to non-school buses is beyond the scope of this rulemaking action, since the only proposed new requirements for school buses. The agency notes that the benefits of applying these requirements to transit buses appear questionable since most school bus-related incidents involve children under the age of seven. Notwithstanding the above discussion, the agency does not prohibit using "school bus" mirror systems on other types of buses.

4. Heated Mirrors

and requested that the agency require school buses to be equipped with heated mirrors, at least for those areas that experience cold weather.

NHTSA recognizes that some northern portions of the country experience weather conditions where mirror systems can become covered with ice and snow. While these conditions affect the potential effectiveness of the mirror systems, NHTSA believes that the responsibility for maintaining the mirror systems, and any part of the vehicle which affects the performance of the mirror systems, is best left with the State and local school districts. The agency further notes that since school buses are manufactured for use in all parts of the country, they must comply with all applicable standards. Therefore, it would be unreasonable to promulgate a national standard that would have little or no benefit for a significant part of the country.

5. Maximum Permissible Number of Mirrors

Several commenters addressed the number of mirrors with which a school bus should be equipped. believed that the new standard should address the number of mirrors allowed on a school bus and the size of the mirrors. While the number of mirrors affect the time a driver needs to search visually the area around the bus, mirror size affects the blind spots created by the mirrors themselves.

believed that the number of rear-view mirrors should be limited to one per side to avoid possible confusion produced by multiple images and reduce the total time drivers must divert their attention from the road ahead.

While NHTSA is aware of the situation mentioned by and no provision limiting the number of mirrors on school buses has been included in this final rule because the agency does not believe that there would be a safety benefit from such a limitation. The agency further notes that a major purpose for this rulemaking's field-of-view approach is to allow school bus users and manufacturers to determine the best mirror system for their particular operating environment.

6. Blind Spots

The requested comments about whether the mirrors would create dangerous blind spots in the driver's direct field-of-view, given the size and location of some convex cross view mirrors.

Several commenters believed that the agency should address the potential problems of blind spots created by mirrors.

believed that any new standard should address the mirror size, since this affects the blind spots created by the mirrors themselves.

suggested that mirrors be located in areas that do not obstruct the driver's direct view of traffic and pedestrians.

and a bus driver commented that while convex cross view mirrors do not create significant blind spots, side mounted driving mirrors may decrease visibility.

Other commenters believed that blind spots were not a significant safety problem. stated that the increased field-of-view provided by mirrors offsets the corresponding blind spots.

stated that blind spots created by a cross view mirror on one side of the bus can be viewed in the cross view mirror system on the other side of the bus.

NHTSA agrees with that blind spots in the direct field-of-view created by mirrors themselves are offset by the larger indirect field-of-view provided by the mirror system. Although NHTSA does not believe it is appropriate to establish requirements for mirror locations, the agency does believe that mirror and school bus manufacturers should strive to develop mirror locations which limit the amount of obstruction to the driver's direct field of view.

7. Glare from Mirrors

The asked whether glare from some cross view mirror designs, caused by turn signals and other school bus lights, would reflect light from flashing turn signals into the driver's eye.

Of those who commented on this issue

no commenter believed that glare caused a significant safety problem. Based on the comments, the agency does not believe that reflected light or glare from convex mirrors presents an unreasonable safety risk to school bus drivers.

8. Non-Mirror Systems

The discussed the docket comments received about mechanical and electronic devices which could be used either to keep students away from critical areas around the school bus or to alert school bus drivers to the presence of someone in a critical area around the bus. The agency explained that mirrors offer the most effective means of providing the school bus driver with a complete view in front of and along both sides of the bus. The agency believed that requiring these

additional non-mirror devices "would substantially increase compliance costs without significantly increasing safety benefits."

The agreed that instead of requiring such devices, it would be more cost effective to evaluate their effectiveness through pilot programs.

the manufacturer of an electronic detection system, requested that the agency modify the field-of-view requirements to allow compliance through mirrors or sensing/detection devices.

believed that the was unduly negative toward its type of product and requested that critical comments from and Built about non-mirror systems be stricken from the docket.

The agency continues to believe that, in terms of performance, reliability, and cost, mirrors offer the best means for school bus drivers to become aware of pedestrians in front of and along both sides of the bus. Accordingly, the agency does not agree with the belief that sensing/detection devices should be allowed as a means of meeting the standard's field-of-view requirements. Notwithstanding this decision, sensing/detection devices may be used as supplementary devices on school buses.

G. Costs

In previous notices, NHTSA considered the rulemaking's expected cost. The estimated that the unit cost for a System B convex cross view mirror with a bracket plus installation would range from \$52 to \$107. The explained that the costs of an additional convex cross view mirror would range from \$58 for a four 8" (17" convex mirror system to \$121 for an 8"x12" quadrispheric "Bus Boy" mirror system. The proposal noted that, since school bus manufacturers and users were free to choose what convex cross view mirror system they would use to comply with the performance requirements, those parties' choices would greatly affect the ultimate costs. However, the agency anticipated that the cost of complying with the proposed changes would be minimal because of the current State mirror specifications. For example, States that currently specify four 8" (17" convex mirrors on cross view tripods, at a cost of \$58.00, could switch to a pair of elliptical mirrors which cost nearly the same—\$58.10.

The requested comments about this proposal's cost to school bus users and information about current State requirements for school bus mirrors.

Several commenters, including States and school bus manufacturers, generally

agreed with the cost estimates.

The and commented that the cost estimates were accurate. commented that the parts cost (i.e., mirrors and mounting arms) of four currently used standard 8" mirrors on a conventional bus is \$44; while, the cost of two mirrors and brackets would be \$51, a \$7 difference. While did not provide a cost for installation, the agency believes that the installation cost for two mirrors would be approximately the same as four 8" convex mirrors, if two such mirrors are mounted on the same bracket.

A few commenters believed the rulemaking would result in significant additional costs. a mirror manufacturer, stated that the aftermarket cost of a dual set of motorized and heated mirrors would be \$362.05. The agency notes that these mirrors include motorized and heated features that the standard does not require. commented that available mirror systems that will meet the proposals have an additional cost of approximately \$115.00 per bus above the cost of the standard mirror system it currently uses.

believed that the cost of installation and adjustment may exceed the cost of the hardware for some mirror systems, but provided no details to support the statement.

After reviewing the available information, NHTSA believes that the initial cost estimates are generally reasonable. With respect to System A costs, the agency notes that all buses are typically equipped with supplemental convex driving mirrors as part of their System A mirrors. Thus, no real change in these mirrors would be necessary for school bus users to meet System A requirements. As for concern about installation, the agency has discussed mirror installation with bus manufacturers and State and local school district officials at various school transportation trade shows and has not found any supporting information for claim.

As to comment on the \$115 difference in the cost for a compliant mirror system, they were referring to a quadrispheric mirror system. They also inadvertently included the cost of the right and left side flat, rearview mirrors as part of the cost increase; this was not appropriate.

resubmitted a cost increase of \$30 per bus, to the consumer, when equipped with a quadrispheric mirror system rather than the standard four 8" convex cross view mirror system. They further stated that as such mirror

systems gain popularity among the users, that cost will drop.

With regard to estimate of 80 man hours needed to complete a compliance test of a single bus-seat-mirror combination, it has been the agency's experience, through that about ten man hours are necessary to do this type of test. Included in the agency's time estimate are such tasks as locating the cylinders around the bus, adjusting the mirrors, mounting a camera tripod in the driver's seat area, taking slides, processing film, and analyzing slides. The agency's estimate does not include one-time tasks such as setting up a grid of one foot by one foot squares and the constructing the test cylinders. Although many bus-seat-mirror configurations will need to be tested, once a particular configuration has been certified to meet the standard, that configuration will not need to be retested in subsequent years. Therefore, such one-time test costs would be distributed over the years that such a configuration is in use. Also, the agency believes that a limited number of design changes in bus exteriors and/or drivers' seats occur from year to year and any differences in the location of the 25th percentile adult female's eye location that do occur would be small and should not greatly affect the driver's direct or indirect field of view. These eye location differences among seats would, however, establish a compliance "envelope" spanning the eye locations that allow compliance with the standard. Thus, further reductions in time and cost would occur by not having to test any new configurations that would have minute eye location differences between previously tested configurations. Finally, the agency expects that further time savings will occur as more and more tests are performed.

H Leadtime Requirements

The explained that many mirror systems are now available which would comply with the proposed field-of-view requirements, and thus would not create leadtime constraints from that perspective. Nevertheless, the agency believed that school bus manufacturers and users should be afforded time to investigate and select how they wish to comply with the new field-of-view requirements. Accordingly, the agency proposed an effective date of one year after publication of the final rule.

Several commenters addressed the leadtime necessary for this rulemaking. The favored having the final rule become effective as soon as possible. The stated that there currently are mirrors that could be used

to comply with the one year leadtime requirements. NSTA requested a leadtime of 18 months after publication of the final rule for the effective date, claiming that additional time was necessary to allow school districts to budget for the additional costs associated with the rulemaking.

After reviewing the comments, the agency continues to believe that a one-year leadtime after the final rule's publication provides adequate time for school bus manufacturers and users to determine how to comply with the new field-of-view requirements. The agency notes that most school bus manufacturers are already familiar with all of the brands of mirrors. The extra six months requested by NSTA is not warranted on the basis of other comments.

This final rule does not have any retroactive effect. Under section 103(d) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392(d)), whenever a Federal motor vehicle safety standard is in effect, a State may not adopt or maintain a safety standard applicable to the same aspect of performance which is not identical to the Federal standard. Section 105 of the Act (15 U.S.C. 1394) sets forth a procedure for judicial review of final rules establishing, amending or revoking Federal motor vehicle safety standards. That section does not require submission of a petition for reconsideration or other administrative proceedings before parties may file suit in court.

Rulemaking Analyses and Notices

Executive Order 12291 (Federal Regulation) and DOT Regulatory Policies and Procedures

NHTSA has considered the costs and other impacts of this rulemaking, and a Final Regulatory Evaluation (FRE) has been prepared and placed in the docket. Based on this evaluation, the agency has determined that the rulemaking is not "major" within the meaning of Executive Order . However, it is "significant" within the meaning of the Department of Transportation's regulatory policies and procedures.

As explained in the FRE, the additional cost of installing a pair of compliant convex cross view mirrors on a new school bus could range from no cost to as much as \$30 per school bus, depending on the type of mirror system selected by the school district. About 38,000 new school buses are sold each year, and according to about 12 percent of all their buses are equipped with a compliant mirror system. Therefore, assuming Blue Bird's

sales breakdown is representative of the overall bus manufacturing industry, about 33,440 buses (38,000 × 88 percent) will have to be equipped with a compliant system. Therefore, the aggregate annual cost to consumers would range from no cost to about \$1,003,200. (33,400 × \$30 per bus).

NHTSA anticipates that the actual costs will likely be nearer the lower end of the estimated cost range for the following reasons. Buyers will probably select lower cost mirrors since they are quite sensitive to cost. At the same time, economies of scale and competition will lower the costs of the more expensive mirrors. The agency further notes that since nearly all States now require school buses to have more mirrors than required by the costs of complying with this rulemaking could even result in a cost savings for those school buses being sold in jurisdictions where buses are currently equipped with more expensive mirrors than a mirror system that will now be allowed under the amendments.

As mentioned in this notice's "background" section, an average of 26 students are fatally injured and another 283 are injured when struck by their own school bus. While the effectiveness of upgrading the requirements for school bus mirrors cannot be conclusively established, accounts in the NAS report and docket comments indicate that some injuries and fatalities will be avoided.

Regulatory Flexibility Act

NHTSA has considered the effects of this action under the Regulatory Flexibility Act. I hereby certify that it will not have a significant economic impact on a substantial number of small entities. School bus manufacturers are generally not small businesses within the meaning of the Regulatory Flexibility Act. Small governmental units and small organizations are generally affected by amendments to the Federal motor vehicle safety standards as purchasers of new school buses. However, as discussed above, such entities that purchase school buses should see little change with regard to the price of new buses that are equipped with compliant mirrors. In addition, the agency notes that less than six mirror manufacturers provide nearly all of the school bus mirrors in use today. Although they are small companies, each has a full product line, including mirrors that can meet the amended standard. Thus, the likely impact should only be a shift in sales of particular mirror types. Accordingly, the agency has determined that preparation of a

regulatory flexibility analysis is unnecessary.

Executive Order (Federalism)

This rulemaking has been analyzed in accordance with the principles and criteria contained in

and NHTSA has determined that it does not have sufficient federalism implications to warrant preparation of a Federalism Assessment.

In its analysis, the agency considered the amendment's likely effect on the States and possible alternatives to the rulemaking. The agency has determined that virtually all States require school buses to be equipped with more mirrors than current Standard No. 111 requires. As this preamble explained earlier, the amendment provides general performance-oriented requirements that the States may exceed. Although the amendments will supersede the current school bus mirror requirements of a large number of States, any required State regulatory changes will only involve a relatively minor administrative or legislative action that should not require extensive discussion or debate, since the change will improve the level of driver visibility. In addition, because the amendment eliminates current specific requirements which serve to prohibit certain mirror designs, the rulemaking provides additional flexibility to the States. The agency further notes that the amended requirements are similar to the recommendation approved by 86 percent of the State representatives at the *on School Transportation*. In addition, State commenters to the *on School Transportation* favored the field-of-view requirements. NHTSA accordingly does not expect any significant adverse effect on the States as a result of this rulemaking.

National Environmental Policy Act

NHTSA has also analyzed this rulemaking action for purposes of the National Environmental Policy Act. The agency has determined that implementation of this action will not have any significant impact on the quality of the human environment. Although there will likely be an increase in production of certain mirror types, this increase will not introduce any new or particularly harmful effects to the environment.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicle.

PART 571—Federal Motor Vehicle Safety Standards

In consideration of the foregoing, 49 CFR part 571 is amended, as follows:

1. The authority citation for part 571 of title 49 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§ 571.111 [Amended]

2. In § 571.111, S4 is amended by adding the following definition in alphabetical order.

Effective mirror surface means the portions of a mirror that reflect images, excluding the mirror rim or mounting brackets.

3. In § 571.111, S9 through S9.2(b) is revised and a new S9.3 through S9.4(b)(2) is added, to read as follows:

S9. Requirements for School Buses.

When a school bus is tested in accordance with the procedures of S13, it shall meet the requirements of S9.1 through S9.4.

S9.1 Outside Rearview Mirrors. Each school bus shall have two outside rearview mirror systems: System A and System B.

S9.2 System A shall be located with stable supports so that the portion of the system on the bus's left side, and the portion on its right side, each:

(a) Includes at least one mirror of unit magnification with not less than 322.60 square centimeters (50 square inches) of reflective surface; and

(b) Includes one or more mirrors which together provide, at the driver's eye location, a view of:

(1) For the mirror system on the right side of the bus, the entire top surface of cylinder N in Figure 2, and of that area of the ground which extends rearward from the mirror surface not less than 60.93 meters (200 feet).

(2) For the mirror system on the left side of the bus, the entire top surface of cylinder M in Figure 2, and of that area of the ground which extends rearward from the mirror surface not less than 60.93 meters (200 feet).

S9.3(a) For each of the cylinders A through P whose entire top surface is not directly visible from the driver's eye location, System B shall provide, at that location:

(1) A view of the entire top surface of that cylinder.

(2) A view of the ground that overlaps with the view of the ground provided by system A.

(b) Each mirror installed in compliance with S9.3(a) shall meet the following requirements:

(1) Each mirror shall have a projected area of at least 258.08 square centimeters (40 square inches), as measured on a plane at a right angle to the mirror's axis.

(2) Each mirror shall be located such that the distance from the center point of the eye location of a 25th percentile adult female seated in the driver's seat to the center of the mirror shall be at least 95.25 centimeters (37.5 inches).

(3) Each mirror shall have no discontinuities in the slope of the surface of the mirror.

(4) Each mirror system shall be installed with a stable support designed to dampen vibration.

(c) Each school bus which has a mirror installed in compliance with S9.3(a) that has an average radius of curvature of less than 88.90 centimeters (35 inches), as determined under S12, shall have a label visible to the seated driver. The label shall be printed in a type face and color that are clear and conspicuous. The label shall state the following:

"USE CROSS VIEW MIRRORS TO VIEW PEDESTRIANS WHILE BUS IS STOPPED. DO NOT USE THESE MIRRORS TO VIEW TRAFFIC WHILE BUS IS MOVING. IMAGES IN SUCH MIRRORS DO NOT ACCURATELY SHOW ANOTHER VEHICLE'S LOCATION."

S9.4(a) Each image required by S9.3(a)(1) to be visible at the driver's eye location shall be separated from the edge of the effective mirror surface of the mirror providing that image by a distance of not less than 3 minutes of arc.

(b) The image required by S9.3(a)(1) of cylinder P shall meet the following requirements:

(1) The angular size of the shortest dimension of that cylinder's image shall be not less than 3 minutes of arc; and

(2) The angular size of the longest dimension of that cylinder's image shall be not less than 9 minutes of arc.

4. Section 571.111 is amended by adding a new S13 through S13.6, to read as follows:

S13. School bus mirror test procedures. The requirements of S9.1 through S9.4 shall be met when the vehicle is tested in accordance with the following conditions.

S13.1 The cylinders shall be a color which provides a high contrast with the surface on which the bus is parked.

S13.2 The cylinders are 0.3048 meters (1 foot) high and 0.3048 meters (1 foot) in diameter, except for cylinder P which is 0.9114 meters (3 feet) high and 0.3048 meters (1 foot) in diameter.

S13.3 Place cylinders at locations as specified in S13.3(a) through S13.3(g) and illustrated in Figure 2. Measure the

distances shown in Figure 2 from a cylinder to another object from the center of the cylinder as viewed from above.

(a) Place cylinders G, H, and I so that they are tangent to a transverse vertical plane tangent to the forward-most surface of the bus's front bumper. Place cylinders D, E, F so that their centers are located in a transverse vertical plane that is 1.8288 meters (6 feet) forward of a transverse vertical plane passing through the centers of cylinders G, H, and I. Place cylinders A, B, and C so that their centers are located in a transverse vertical plane that is 3.6576 meters (12 feet) forward of the transverse vertical plane passing through the centers of cylinders G, H, and I.

(b) Place cylinders B, E, and H so that their centers are in a longitudinal vertical plane that passes through the bus's longitudinal centerline.

(c) Place cylinders A, D, and G so that their centers are in a longitudinal vertical plane that is tangent to the most

outboard edge of the left side of the bus's front bumper.

(d) Place cylinders C, F, and I so that their centers are in a longitudinal vertical plane that is tangent to the most outboard edge of the right side of the bus's front bumper.

(e) Place cylinder J so that its center is in a longitudinal vertical plane 0.3048 meters (1 foot) to the left of the longitudinal vertical plane passing through the centers of cylinders A, D, and G, and is in the transverse vertical plane that passes through the centerline of the bus's front axle.

(f) Place cylinder K so that its center is in a longitudinal vertical plane 0.3048 meters (1 foot) to the right of the longitudinal vertical plane passing through the centers of cylinders C, F, and I, and is in the transverse vertical plane that passes through the centerline of the bus's front axle.

(g) Place cylinders L, M, N, O, and P so that their centers are in the transverse vertical plane that passes through the centerline of the bus's rear axle. Place

cylinder L so that its center is in a longitudinal vertical plane that is 1.8288 meters (6 feet) to the left of the longitudinal vertical plane tangent to the bus's most outboard left surface (excluding the mirror system). Place cylinder M so that its center is in a longitudinal vertical plane that is 0.3048 meters (1 foot) to the left of the longitudinal vertical plane tangent to the left side of the bus. Place cylinder N so that its center is in a longitudinal vertical plane that is 0.3048 meters (1 foot) to the right of the longitudinal vertical plane tangent to the right side of the bus. Place cylinder O so that its center is in a longitudinal vertical plane that is 1.8288 meters (6 feet) to the right of the longitudinal vertical plane tangent to the right side of the bus. Place cylinder P so that its center is in a longitudinal vertical plane that is 3.6576 meters (12 feet) to the right of the longitudinal vertical plane tangent to the right side of the bus.



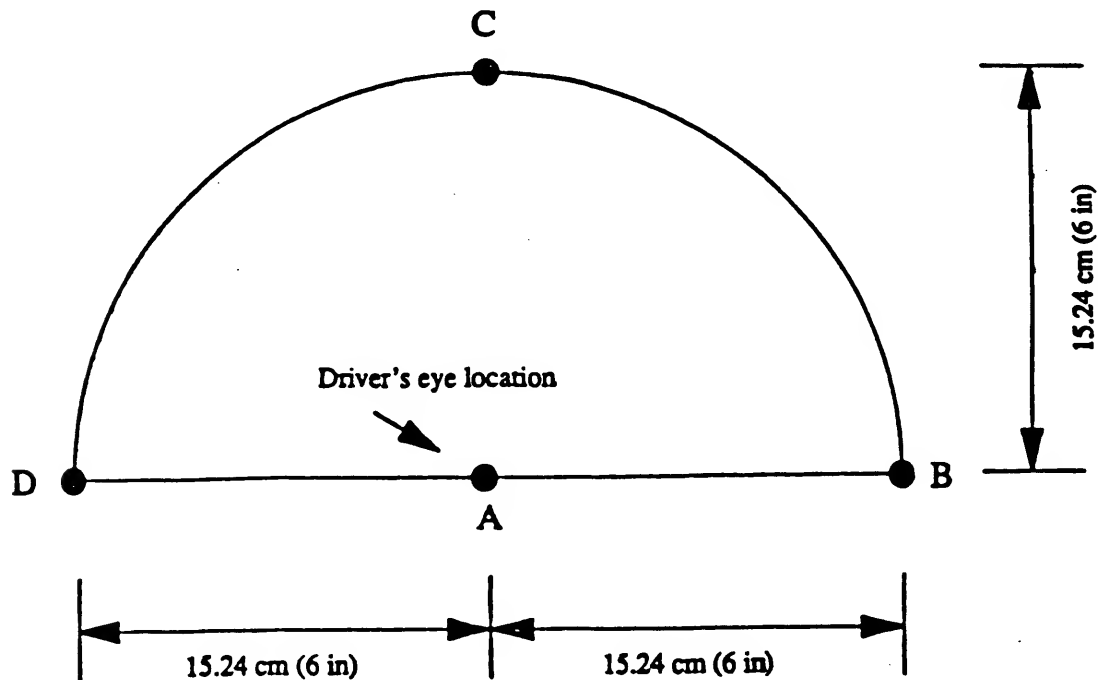


Figure 3.

Camera Locations for School Bus Field-of-View Test

BILLING CODE 4010-00-C

S13.2 The driver's eye location is the eye location of a 25th percentile adult female, when seated in the driver's seat as follows:

(a) The center point of the driver's eye location is the point located 68.58 centimeters (27 inches) vertically above the intersection of the seat cushion and the seat back at the longitudinal centerline of the seat.

(b) Adjust the driver's seat to the midway point between the forward-most and rear-most positions, and if separately adjustable in the vertical direction, adjust to the lowest position. If an adjustment position does not exist at the midway point, use the closest adjustment position to the rear of the

midpoint. If a seat back is adjustable, adjust the seat back angle to the manufacturer's nominal design riding position in accordance with the manufacturer's recommendations.

S13.3 Adjustable mirrors are adjusted before the test in accordance with the manufacturer's recommendations. Such mirrors are not moved or readjusted at any time during the test.

13.4 Place a 35 mm or larger format camera, or video camera, so that its image plane is located at the center point of the driver's eye location or at any single point within a semicircular area established by a 15.24 centimeter (6 inch) radius parallel to and forward of

the center point (see figure 3). With the camera at any single location on or within that semicircle look through the camera and the windows of the bus and determine whether the entire top surface of each cylinder is directly visible.

S13.5 For each cylinder whose entire top surface is determined under paragraph 13.4 of this section not to be directly visible at the driver's eye location,

(a) Place a comparison chart (see figure 4) above the mirror that provides the fullest view of the cylinder in situations where a cylinder is partially visible through more than one mirror.

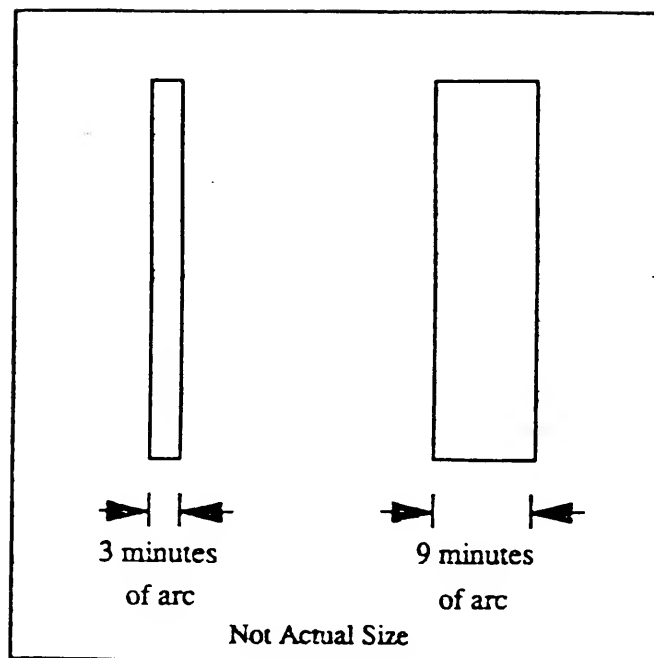


Figure 4.

Comparison Chart for Indirect Field-of-View Measurements

The width of the bars in Figure 4 indicating three minutes of arc and nine minutes of arc are derived from the following formula:

For 3 minutes of arc:

$$X = D \times 0.000873,$$

Where:

X = the width of a line, in the unit of measurement D, representing 3 minutes of arc;

D = distance from center point of driver's eye location to the center of the mirror's surface; and

0.000873 = tangent of 3 minutes of arc.

For 9 minutes of arc:

$$X = D \times 0.002618,$$

Where:

X = the width of a line, in the unit of measurement D, representing 9 minutes of arc;

D = distance from center point of driver's eye location to the center of the mirror's surface; and

0.002618 = tangent of 9 minutes of arc.

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(b) Photograph each cylinder through the mirror(s) that provides a view of the cylinder. Photograph each cylinder with the camera located so that the view through its film or image plane is located at any single location within the semicircle established under 13.4, [POINT A,B,C, OR D] ensuring that the image of the mirror and comparison chart fill the camera's view finder to the extent possible.

13.6 Make all observations and take all photographs with the service/entry door in the closed position and the stop signal arm(s) in the fully retracted position.

Issued on: 1992.

Administrator.

Filed 92:

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Appendix B:

SELECTED PHOTOGRAPHS

A total of forty-six color copies of photographs are presented and referenced as Photograph #01 through Photograph #46. Photographs numbered #01 through #04 were taken and made available by the investigating County Sheriff Department. Photographs numbered #05 through #46 were taken by the Transportation Research Center.

NOTES:

The sixteen orange, sport and safety cones visible in the photographs were placed in accordance with the test cylinder placement protocol as presented within the Final Rule for Federal Motor Vehicle Safety Standard, Number 111, Rearview Mirrors (Convex Cross View Mirrors on School Buses) published (Docket No. 89-26; Notice 3) in the Federal Register / Vol. 57, No. 232 / Wednesday, December 2, 1992 / Rules and Regulations, pages 57000-57020.

Two lens were used to show the field of view from the driver's seat. A 55 millimeter lens depicted the "normal" eye field of vision; a 135 millimeter lens, providing approximately 2.5 power magnification, was used to enhance the visibility present through the rearview mirrors.

WARNING

The following page contains a photograph with graphic detail
which shows the tragic consequences of a motor vehicle crash!



01: On-scene view in westbound lane of residual impact evidence of child who had just exited bus; NOTE: possible brain tissue on pavement (cells C5--D5)



02: On-scene southward view in westbound lane of residual impact evidence of child who had just exited bus; NOTE: child heading toward driveway in background



03: On-scene view of Case Vehicle's front left bumper and left front tire, which knocked child down and passed over her, respectively



04: On-scene view of Case Vehicle's driver seating area, showing two-point lap belt and driver's seat--positioned fully rearward



05: Eastward view of approximate impact location of westbound Case Vehicle and child who had just exited bus; NOTE: impact near mailbox (cell E4)



06: Case Vehicle's westward travel path in westbound lane approximately 50 meters (164 feet) east of impact near mail box (cell E4)



07: Case Vehicle's westward travel path in westbound lane approximately 25 meters (82 feet) east of impact near mail box (cell D4)



08: Case Vehicle's westward travel path in westbound lane approximately 5 meters (16 feet) east of impact near mail box (cell D5)



09: Case Vehicle viewed in alignment with cones A, D, and G and longitudinal vertical plane tangent to left bumper; NOTE: measuring stick marks impact area



10: Case Vehicle viewed in alignment with cones B, E, and H and longitudinal vertical plane through center of bus; NOTE: measuring stick marks impact area

Case Vehicle: 1981 Ford B700 Bus Chassis--Body by Wayne-McFadden



11: Case Vehicle viewed in alignment with cones C, F, and I and longitudinal vertical plane tangent to right bumper; NOTE: bricks secure tape measures



12: Case Vehicle and forward test cones A-I viewed from approximately 30 degrees right of front; NOTE: outside, convex, rearview mirrors mounted bilaterally

Case Vehicle: 1981 Ford B700 Bus Chassis--Body by Wayne-McFadden



13: Case Vehicle's right front wheel and test cone K aligned with axle; NOTE: bracket locations for single right, outside, convex, rearview mirror



14: Case Vehicle's right rear, dual wheels and test cone P aligned with axle; NOTE: test cone P blocks view of cones O and N



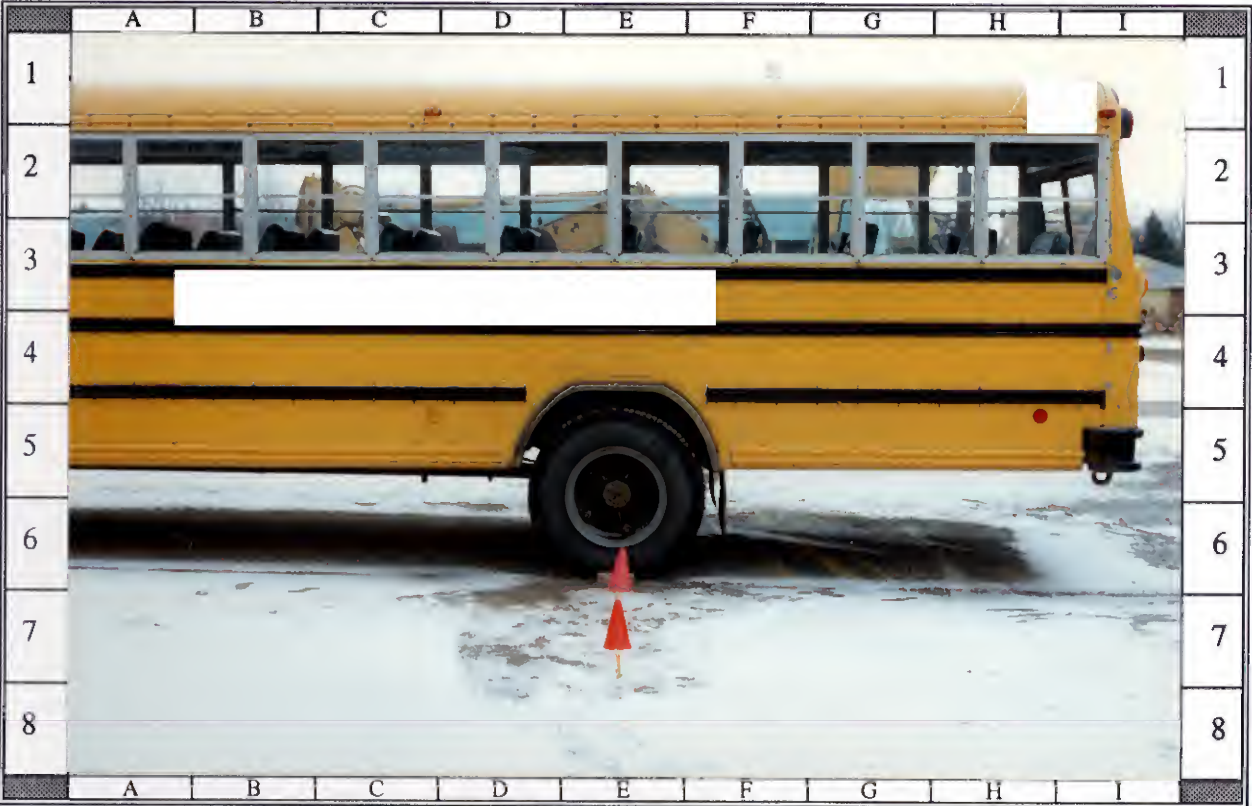
15: Case Vehicle and test cones B, C, F, I, K, N, and O viewed from approximately 45 degrees right of back; NOTE: cones N and O are aligned with rear axle



16: Case Vehicle's back and partially visible test cones L (left) and N (right); NOTE: seating visible through glazing



17: Case Vehicle and test cones J (left front), I & K (right front), L & M (left rear), and O (right rear) viewed from approximately 60 degrees left of back



18: Case Vehicle's left rear, dual wheels and test cones L and M, aligned with axle

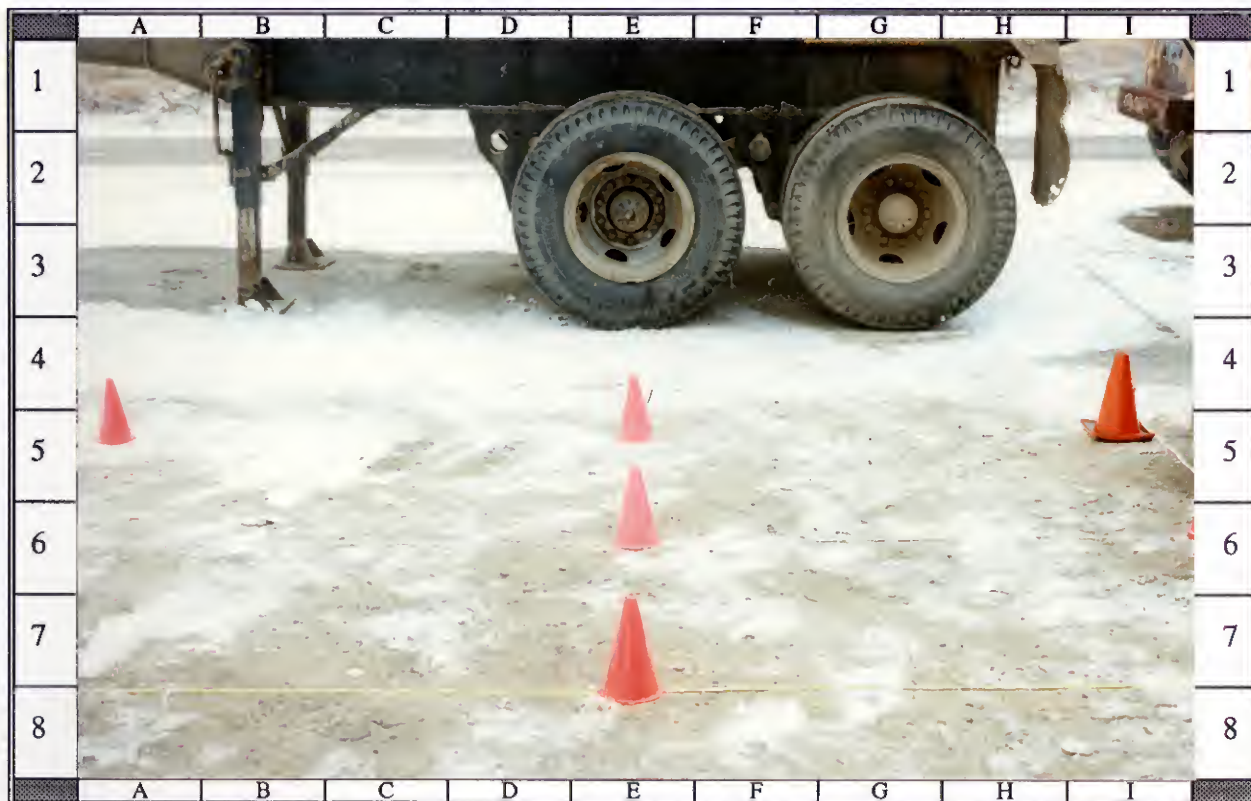


19: Case Vehicle's left front wheel and test cone J aligned with axle; NOTE: bracket locations for single left, outside, convex, rearview mirror



20: Case Vehicle viewed in alignment with cones G, H, and I and transverse vertical plane tangent to front bumper; NOTE: right side mirror forward of one on left

Case Vehicle: 1981 Ford B700 Bus Chassis--Body by Wayne-McFadden



21: Case Vehicle's forward test cones D, E, and F viewed in alignment with transverse vertical plane 1.83 meters (6 feet) forward of front bumper



22: Case Vehicle's forward test cones A, B, and C viewed in alignment with transverse vertical plane 3.66 meters (12 feet) forward of front bumper



23: Case Vehicle and forward test cones A, B, and D-I viewed from approximately 30 degrees left of front; NOTE: measuring stick marks impact area



24: Case Vehicle driver's forward view through windshield of left third of bus's front; NOTE: bricks (cells E5 and I5) are ~ 6.1 m (20 ft) forward of bumper



25: Case Vehicle driver's forward view through windshield of center third of bus's front; NOTE: brick (cell D6) is ~ 6.1 meters (20 feet) forward of bumper



26: Case Vehicle driver's forward view through windshield of right third of bus's front; NOTE: windshield's center support bar and right wiper blade placement



27: Normal view from Case Vehicle's driver seat through left, outside, unit magnification mirror; NOTE: test cones L and M are not visible



28: Telephoto view from Case Vehicle's driver seat through left, outside, unit magnification mirror; NOTE: test cones L and M are not visible



29: Normal view from Case Vehicle's driver seat through left, outside, convex, cross-view mirror



30: Normal view from Case Vehicle's driver seat through left, outside, convex, cross-view mirror with view moving left and up relative to steering wheel



31: Telephoto view from Case Vehicle's driver seat through left, outside, convex, crossview mirror focusing down left side



32: Telephoto view from Case Vehicle's driver seat through left, outside, convex, crossview mirror focusing across front



33: Telephoto view from Case Vehicle's driver seat through left, outside, convex, crossview mirror pointing to cone C and showing cones F, B, and E



34: Telephoto view from Case Vehicle's driver seat through left, outside, convex, crossview mirror pointing to cone F and showing cones C, B, and E



35: Normal view from Case Vehicle's driver seat through right, outside, convex, crossview mirror; NOTE: wiper could obstruct view of a shorter viewer



36: Normal view from Case Vehicle's driver seat through right, outside, convex, crossview mirror; NOTE: viewer raised up above windshield wiper



37: Telephoto view from Case Vehicle's driver seat through right, outside, convex, crossview mirror focusing across front; NOTE: only cone H visible



38: Telephoto view from Case Vehicle's driver seat through right, outside, convex, crossview mirror focusing down right side showing cones O and P



39: Normal view from Case Vehicle's driver seat through right, outside, unit magnification mirror; NOTE: no test cones are visible



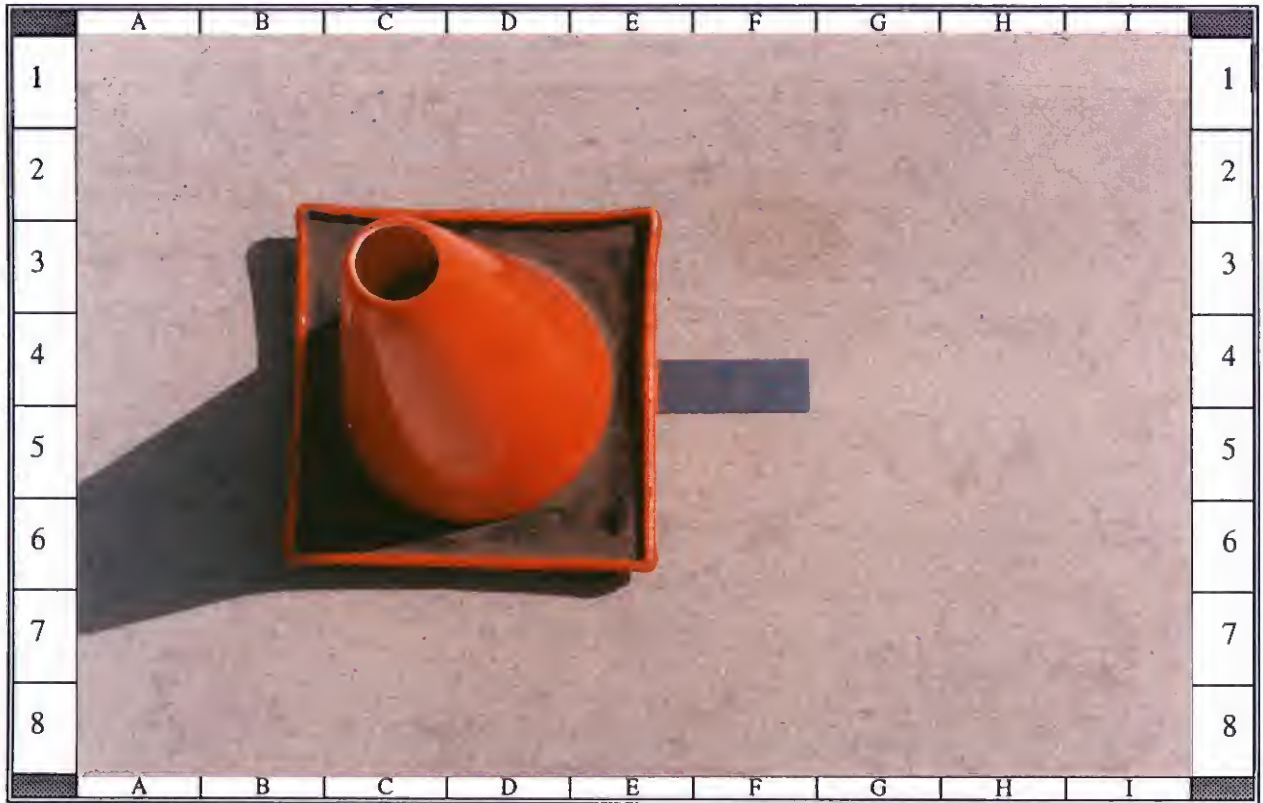
40: Normal view from Case Vehicle's driver seat through right, outside, unit magnification mirror after viewer moves forward; NOTE: no visible test cones



41: Telephoto view from Case Vehicle's driver seat through right, outside, unit magnification mirror; NOTE: test cones N, O, and P are not visible



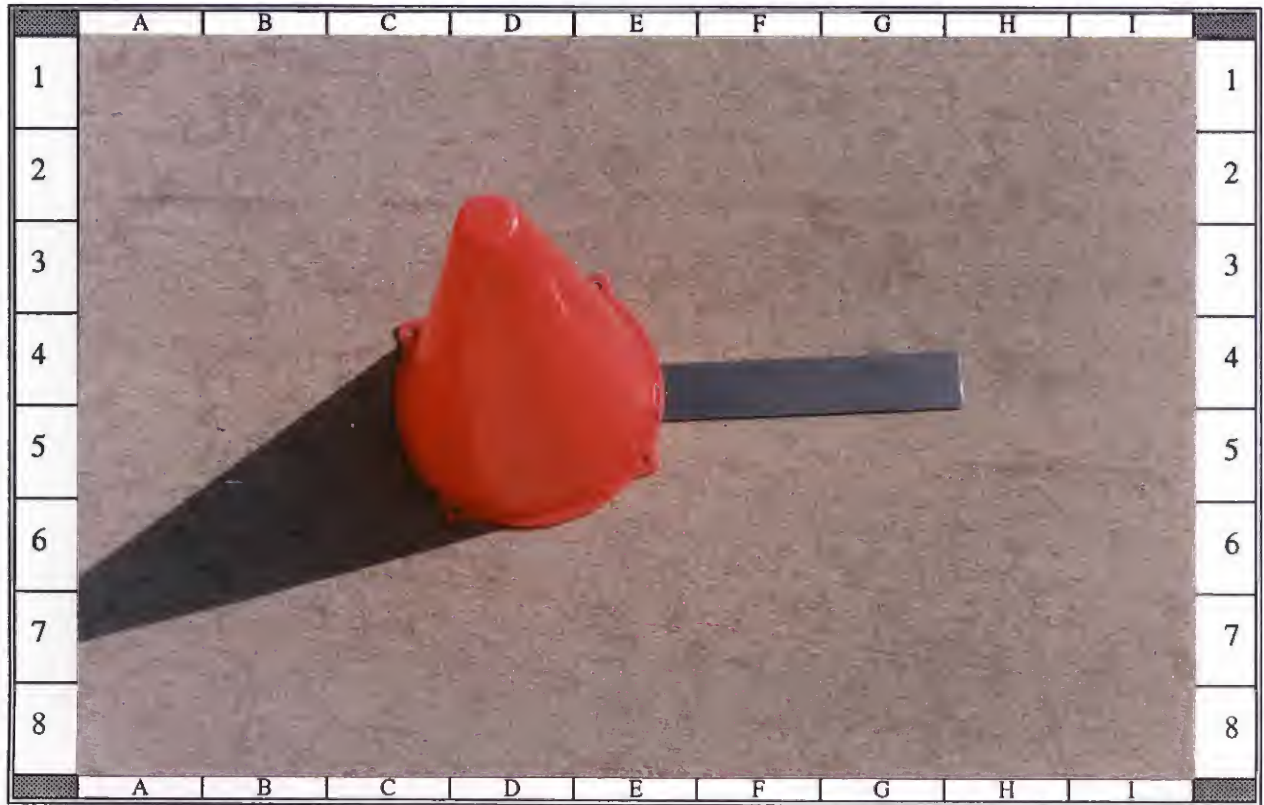
42: Normal view from Case Vehicle's driver seat through inside, unit magnification, rearview mirror showing passenger seating area



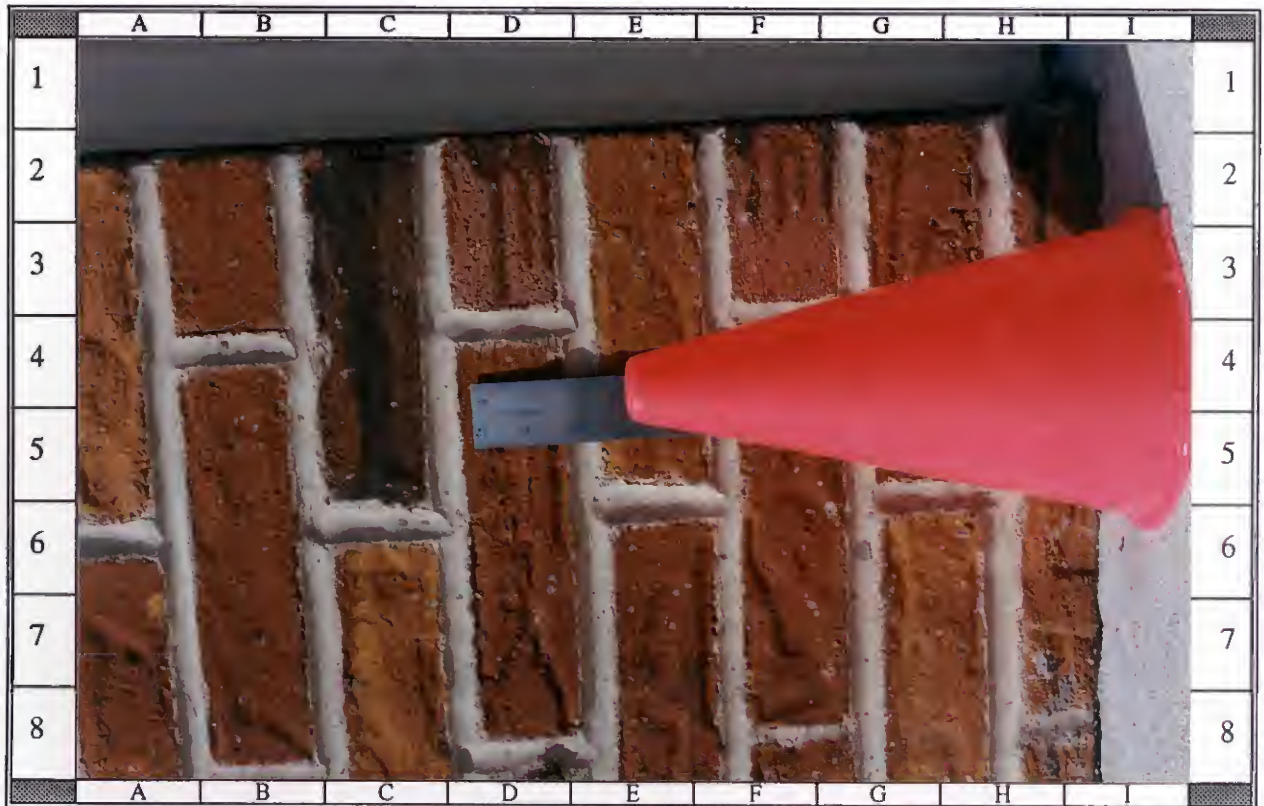
43: Base dimension of test cones used in test locations G and I [approximately 0.22 meters (0.71 feet)]



44: Height of test cones used in test locations G and I [approximately 0.3048 meters (1.00 feet)]



45: Base dimension of test cones used in test locations A-F, H, and J-O [approximately 0.15 meters (0.50 feet)]



46: Height of test cones used in test locations A-F, H, and J-O [approximately 0.23 meters (0.75 feet)]

ACCIDENT COLLISION MEASUREMENT TABLE



U.S. Department of Transportation
National Highway Traffic Safety
Administration

ACCIDENT COLLISION MEASUREMENT TABLE

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

Primary Sampling Unit Number 10

Case Number - Stratum 9522

ACCIDENT COLLISION DIAGRAM																														
<p><u>Document the physical plant:</u></p> <ul style="list-style-type: none"> • all road/roadway delineation (e.g., curbs/edge lines, lane markings, median markings, pavement markings, parked vehicles, poles, signs, etc.) • all traffic controls (e.g., speed limit) • north arrow placed on diagram • roadway surface type and condition of applicable roadways • grade measurements for all applicable roadways and at location of rollover initiation • roadway curvature 	<p><u>Document vehicle dynamics including:</u></p> <ul style="list-style-type: none"> • reference point and reference line relative to physical features present at the scene • scaled documentation of all accident induced physical evidence • scaled documentation of all roadside objects contacted • scaled representations of the vehicle(s) at pre-impact, impact, and final rest based upon either: <ul style="list-style-type: none"> a) physical evidence, or b) reconstructed accident dynamics 	<p>CRASH DATA</p> <table border="0"> <thead> <tr> <th></th> <th>VEH. #1</th> <th>VEH. #2</th> <th>VEH. #3</th> </tr> </thead> <tbody> <tr> <td>Heading Angle</td> <td><u>N/A</u></td> <td></td> <td></td> </tr> <tr> <td>Surface Type</td> <td><u>ASPHALT</u></td> <td></td> <td></td> </tr> <tr> <td>Surface Condition</td> <td><u>RELATIVELY NEW-DRY</u></td> <td></td> <td></td> </tr> <tr> <td>Coefficient of Friction</td> <td><u>0.80</u></td> <td></td> <td></td> </tr> <tr> <td>Grade (v/h) Measurement (between impact and final rest)</td> <td><u>2.1% POSITIVE TO WEST</u></td> <td></td> <td></td> </tr> <tr> <td>Grade (v/h) Measurement (at location of rollover initiation)</td> <td><u>N/A</u></td> <td></td> <td></td> </tr> </tbody> </table>		VEH. #1	VEH. #2	VEH. #3	Heading Angle	<u>N/A</u>			Surface Type	<u>ASPHALT</u>			Surface Condition	<u>RELATIVELY NEW-DRY</u>			Coefficient of Friction	<u>0.80</u>			Grade (v/h) Measurement (between impact and final rest)	<u>2.1% POSITIVE TO WEST</u>			Grade (v/h) Measurement (at location of rollover initiation)	<u>N/A</u>		
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Reference Point: GTE JUNCTION BOX
NORTH ROADSIDE - 2.7m N of RL

Reference line: NORTH EDGE LINE

Item	Distance and Direction from Reference Point	Distance and Direction from Reference Line
ESTIMATED C/F ≈ 0.80		
ROAD WIDTH N-S 6.4m		
NORTH SHOULDER WIDTH 0.9m		
SOUTH SHOULDER WIDTH 1.2m		
CENTERLINE DSY (N-S) 3.2m		
GRADE 1" IN 48" = 2.1% POS TO W		
N + S DRIVES ESTIMATED FROM PHOTOS		
POOL OF BLOOD	6.4m W	2.4m S
INSIDE RR DUAL WHEELS	37.5m W	ON
OUTSIDE RR DUAL WHEEL	36.9m W	ON
LF WHEEL	43.9m W	0.06m N

[illegible]

**POLICE ACCIDENT REPORT
AND
POLICE INCIDENT REPORT**

Authority: 1949 PA 300, Sec. 257.622
Compliance: Required
Penalty: \$100 and/or 90 days

Do Not Use

Complaint #

ORI:

Traffic Crash Report

File Class

Crash Date Crash Time

Department Name

Complaint Disposition

Reviewer

No. of Units

Crash Type

Special Circumstances

Weather

Light

Fatal (Report All)

1. Single Motor Vehicle
2. Head On
3. Head On-Left Turn
4. Angle
5. Rear End
6. Rear End-Left Turn
7. Rear End-Right Turn
8. Sideswipe-Same
9. Sideswipe-Opposite
10. Other: Unknown

1. None
2. Deer
3. School Bus
4. Hit and Run
5. Fleeing Police

Special Study
1. Local
2. State

1. Clear
2. Cloudy
3. Fog Smoke
4. Rain
5. Snow
6. Severe Wind
7. Sleet Hail
8. Other Unknown

1. Daylight
2. Dawn
3. Dusk
4. Dark-Lighted
5. Dark-Unlighted
6. Other Unknown

- Corrected Copy
Replace (Entire Report)
Delete (Entire Report)
Non-Traffic Area
ORV/Snowmobile

County City/Twp

Traffic Control

Construction Zone (If applicable)

Type

Lane Closed

Activity

Relation to Roadway

Area

Road Condition

Total Speed Lanes Limit

14 04

1. Signal
2. Stop Sign
3. Yield Sign
4. None of These1. Const. Maint.
2. Utility1. Yes
2. No1. On Road
2. Off Road
3. None

Location of First Impact

1. Dry
2. Wet
3. Icy
4. Snowy
5. Muddy
6. Slushy
7. Debris
8. Other
9. Unknown1. Dry
2. Wet
3. Icy
4. Snowy
5. Muddy
6. Slushy
7. Debris
8. Other
9. Unknown0
1
2
3
4
5
6
7
8
9

Location on

Name:

1/2

FT

North

East

Beginning of Ramp

MI

South

West

End of Ramp

Intersection:

Unit Number

State Driver License Number

758 461 260

Date of Birth

License Type

Sex

Hazard Action

Month Day Year

O CY
M R

M

1

Position Restraint

1 9

Injury Ejected

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Yes

No

Unit Ty

1. Car
2. Truck
3. Van
4. Motorcycle
5. Other

HBD

Yes

No

Field

Yes

No

Urine

Yes

No

Results

Refuse

Not Offered

Vehicle Registration

State

VIN

Insurance

Property

Location of Greatest Damage

1. Front
2. Rear
3. Left
4. Right
5. Other

First Impact

8

Extent of Vehicle Damage

0 1 2 3 4 5 6

First Name

Middle

Last

Street Address

City

State

Zip

First Name

Middle

Last

Street Address

City

State

Zip

Person Advised

of Damaged

Traffic Control

Date

Public

Other & Phone

UD-10 Form Number

Form Override Number

Unit Number		State		Driver License Number		Month	Day	Year	O	CY	M	Action
1	6	First Name		Middle		Last			C	F	F	
2	7	Street Address		Phone Number		Position	Restraint	Ambulance/Hospital				
3	8	City		State		Zip		Injury	Ejected	Yes	Citation Issued	
4	9	Unit Type		Alcohol		Test Type		Trapped	Yes	Yes	1. Hazardous	
5		Vehicle Registration		HBD		Test Results		A	Yes	2. No	2. Other	
6		VIN		State		VIN		B	Yes	3. Not Equipped		
7		Insurance		Towed To/By		Vehicle Direction		C	Yes	Vehicle Description (year, make, color)	Total	Occup
8		Location of Greatest Damage		Vehicle Type		Vehicle Use		D	Yes			
9		First Impact		Extent of Vehicle Damage		Driveable		E	Yes			
10		Special Vehicles		Vehicle Defect		Private Trailer Type		F	Yes			
11		Date of Birth		Sex		Ejected		G	Yes			
12		Month		Day		Year		H	Yes			
13		hone Number		Pos.		Rest.		I	Yes			
14		First name		Middle		Last		J	Yes			
15		Street Address		Phone Number		Date of Birth		K	Yes			
16		City		State		Zip		L	Yes			
17		Unit Reported on Front		Unit Reported Above		Sequence of Events		M	Yes			
18		Action Prior		Action Prior		Sequence of Events		N	Yes			
19		Most Harmful		Most Harmful		Unit No.		O	Yes			
20		Truck/Bus Information		Carrier Name		GVWR		P	Yes			
21		ICCMC		USDOT		MPSC		Q	Yes			
22		Type & Axles Per Unit		Hazardous Material		Placard		R	Yes			
23		Cargo Body Type		UD-10 Form Number		Investigated at Scene		S	Yes			
24		Reported Date/Time		35/1536		14-27		T	Yes			

Forward Original To:

Criminal Justice Data Center

Do Not Write or Mark On This Side of The Line

Do Not Write or Mark On This Side of The Line

Do Not Write or Mark On This Side of The Line

Unit Reported on Front		Unit Reported Above	
Action Prior	Sequence of Events	Action Prior	Sequence of Events

Most Harmful	Unit No.
Truck/Bus Information	Carrier Name

GVWR	Vehicle Type
Driver's License Type	CDL Restrictions
ICCMC	USDOT
MPSC	Medical Card
Type & Axles Per Unit	Hazardous Material
Cargo Body Type	Placard
UD-10 Form Number	Cargo Spill
Investigated at Scene	Type #
Reported Date/Time	Class #

Crash Diagram and Remarks	
<p>North</p> <p>1/2 mile</p> <p>Diagram showing vehicle positions and directions.</p>	
<p>#1 a Bus. Was stopped to let the kids of #1 went forward before P was completely out of the way. #1 hit the P. #1 felt the thump when she hit P. #1 pulled to the side of the road.</p> <p>A written will follow for more details.</p>	
BEST AVAILABLE	
Photos By	Investigator Name(s) & Badge # (Print Only)

Incident Report

Incident No	Date & Time Reported 1995 15:36	Offense: 9300-1 ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE)		
Occurred From: 1995	Occurred Until: 1995 15:36	Incident Location		
Current Disposition ACTIVE	Disposed To	Municipality	District 04	
Disposition Date 1995	Juveniles Only? NO	TTY Sent? NO	Cancelled?	TTY number
Photos? NO	Consent? NO	Affidavit? NO	Optional Date/Time / / 00:00	
Officer Assigned		Investigating Officer		

P
E
R
S
O
N
S

Name/Address/Phone	Description
Apt#:	Born 1962 MALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes
OTHER 1995 9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)
Apt#:	Born 1960 FEMALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes
WITNESS 1995 9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)
Apt#:	Born 1990 FEMALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes
VICTIM 1995 9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)
Apt#:	Born 1958 MALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes
WITNESS 1995 9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)
Apt#:	Born 1966 FEMALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes
WITNESS 1995 9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)
Apt#:	Born 1947 MALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes
WITNESS 1995 9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)

Continued

SHERIFF'S OFFICE

Incident No I		Date & Time Reported 1995		Offense: 9300-1 ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE	
P E R S O N S	Name/Address/Phone			Description	
	Apt#:			Born 1949 FEMALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes	
	WITNESS 1995		9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)	
				Born 1970 MALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes	
	WITNESS 1995		9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)	
V E H	Apt#:			Born 1945 FEMALE Hgt. 0' 0" WHITE Wgt. 0 Hair Eyes	
	SUSPECT 1995		9300-1	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLES)	
	Description/Name/Comments		Make/Model/Stat	Serial No./Qty/Value	
	Status/Plate Type/VIN		Reg/Evid/Value	Description	
			0.00	1981 FORD YELLOW	
Category			Description		
NO M.O. INFORMATION					

Continued

Incident No	Date and Time Reported 1995	Offense: 9300-1 ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE
N	TAKEN FROM WORDPERFECT DOCUMENT 18036-95	
A	On 1995, at , R/O was dispatched to a 911	
R	call regarding a school bus/pedestrian accident. R/O was at the	
R	west end of the Sheriff's Department at the time of the call and	
A	went directly to the scene.	
T	R/O, Sgt. Dep. Dep. and Dep. all	
V	proceeded to the scene. A short time later, the Sheriff and	
E	Undersheriff arrived at the scene.	
<p>Upon arrival in front of the residence at , R/O found a school bus on the side of the road and a small child laying in the roadway. The Ambulance personnel were already at the scene attending to the victim. R/O approached the victim and found that she had a large wound at the back of her head which was bleeding profusely. R/O left the victim in the care of the ambulance personnel and went to check the driver of the bus.</p> <p>The victim was loaded into the ambulance a short time later and transported to in The victim's parents were at the scene, however R/O did not speak to them at the time. They were identified as and They were transported by a third party to</p> <p>A short time later, another ambulance arrived at the scene to attend to the driver of the bus, She was hysterical at the side of the road, and R/O was able to get her into a squad car. R/O was unable to obtain any information from her at this time.</p> <p>The ambulance attendants were able to get into the ambulance, and she was transported to</p> <p>R/O then spoke to witnesses at the scene and other officers also took statements.</p> <p>R/O checked the roadway and found that it was dry in most areas. There was some snow in small spots on the road, but for the most part, it was dry. There was a light east to west wind at the time, and the temperature was approximately in the lower teens.</p> <p>R/O was in charge of preparing the initial accident report. will be in charge of the accident investigation. Sgt. did take measurements of the scene, which can be obtained from his report.</p> <p>After another bus arrived at the scene, all of the children were removed from the bus involved in the accident onto the other bus, and were taken to the to meet with their parents and counselors. A list of all the students on the bus at the time of the accident is attached to this report. It should be noted that none of the children were spoken to by officers at the</p>		

Continued

Incident No	Date & Time Reported	Offense: 9300-1
I	1995 15:36	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE

N scene.

A R/O then spoke to the witness who was the third car behind the bus
 R at the time of the accident. identified as It
 A should be noted that is also the victim's aunt.
 T related that she saw one child, get off of the bus and cross
 I the street, however she did not see the victim get off the bus, and
 V stated that she questioned whether the victim had gone to school
 E that day. She related that all of the lights on the bus were
 operating and traffic in both lanes was stopped. She then observed
 the bus start to pull away and then pull off to the right side of
 the road. advised that she observed the victim laying
 in the middle of the road. She advised that she ran up to the
 victim and found her lying in the road, bleeding. She stated that
 she screamed for someone to call 911 and to get hold of the
 victim's father at She stated that she did not see the
 victim being hit. could not give any further
 information about the accident.

R/O then advised of the information I had received up to
 that point. advised R/O to go to
 where the suspect had been taken. continued to
 interview witnesses at the scene, along with

R/O then proceeded to where I made contact with
 the bus driver. was in an emergency room and was still
 very distraught, however she was able to give a statement. R/O
 advised her that due to the incident, I needed to have her take a
 P.B.T., and asked her if she would take the test voluntarily. She
 stated that she would submit to any test necessary. The P.B.T. was
 administered by R/O, resulting in a .000% b.a.c. R/O then asked
 if she would be willing to sign a release form for consent
 to a blood alcohol test, and she stated that she would. The
 consent form was signed by on 1995, at
 P.M., and a lab assistant, took the blood sample. The
 sample was seized by R/O and will be submitted to the state crime
 lab for analysis.

R/O then spoke to in an attempt to get her statement
 regarding what had occurred. first stated that she could
 not remember the incident. R/O spoke to her a little further, and
 she then stated that she recalled making the stop and she remebers
 the brother getting off of the bus; she thinks she saw the victim
 get out of the bus. She saw the brother cross in front of the bus,
 and thought that the victim crossed with him. At this time she
 began to pull the bus forward, and heard a thump. She then pulled
 the bus to the right and got out. She stated that she really could
 not recall much after that. She was not able to answer any further
 questions regarding the accident. It should be noted that
 was given a sedative at the hospital, and when she gave the
 statement to R/O, she had already been given the sedative, but was
 able to talk and understood what was going on. She was still very

Continued

Incident No	Date & Time Reported	Offense: 9300-1 ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE
N	1995	
A	distracted at that time.	
R	R/O then cleared the hospital and returned to the Sheriff's	
R	Department to discuss the incident further with. Upon	
A	arrival at the Sheriff's Department, advised that he had	
T	spoke to the victim's parents and other witnesses at the scene.	
I	Those statements can be obtained from his report.	
V		
E	On 1995, R/O again recontacted witnesses who had not been interviewed at the scene. The first witness R/O contacted was the subject who was the first vehicle in the eastbound lane, with a direct view of the front of the school bus. The driver's name is	
He advised that he was the first vehicle in line, and had stopped for the school bus. He advised that the lights on the bus were activated and the stop sign came out on the side of the bus. He observed the kids getting off of the bus. He stated that he observed at least one of the children run across the road. He advised that he observed the bus begin to move before the victim made it across in front of the bus. He advised that the driver began to move the bus, hitting the victim, knocking her down. He advised that the victim was parallel with the bus when it knocked her over in an east/west direction. He believed that the victim's head was facing westbound. He related that the victim was run over by the front and rear tires of the bus. He advised that he was going to call 911, but saw that someone was already calling from a cellular phone. He advised that he left his name and number, but did not remain at the scene.		
R/O also asked to speak to wife of		
She was a passenger in the vehicle at the time of the accident. She was not home at the time, and R/O asked that she call me to give me her statement as soon as possible.		
R/O was able to contact another witness, He was an		
driver who was right behind the vehicle at the time of the accident. He stated that when the accident occurred, he was stopped for the bus, the second car back in the opposite lane, facing the bus. He stated that he saw one subject get off of the bus, and saw the little girl get off of the bus last. He related that the boy ran across the road and made it all of the way across. He then observed the bus to begin pulling ahead. He stated that she was close to the front bumper of the bus, and he related that it appeared to him that she fell face first to the ground; he was not sure if she fell because the bus pushed her or if she just fell. He stated that it appeared to him that the bus moved forward before the victim was able to cross in front of the bus, and that she fell when the bus hit her, landing in front of the bus with her head facing southbound. He related that the front tire of the bus ran over the victim, he believed in the spinal area. He advised that he could not say where the rear tires of the bus ran over the victim because he was waving with his arms, trying to get the bus driver to stop. He stated that he		

Continued

Incident No	Date & Time Reported	Offense: 9300-1
	1995	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE

N does not believe the bus driver ever saw him. He related that the
A driver then pulled the bus to the side of the road, got out, ran
R out to the road and collapsed when she saw the victim.
R stated that while at the scene, he contacted his office in
A speaking to who called 911 from the work office. That
T is how the 911 call was first received regarding the accident.
I stated that he would be available for any further
V statements if needed.
E

At this time all of the statement information R/O had obtained was
turned over to for his accident reconstruction report.
It should also be noted that R/O assisted the
Vehicle Inspector in checking the bus. A report from the inspector
will be turned over to this department for further investigation.
Supplemental reports will be forthcoming from and
regarding other witness statements and accident
reconstruction.

A list of all the students on the bus at the time of the accident
is attached to this report.

STATUS:

Open pending further investigation by and receipt of
report from Vehicle Inspector.

RESPECTFULLY SUBMITTED,

BADGE

Continued

Incident No	Date & Time Reported	Offense: 9300-1			
	1995	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE			
N A R A T I V E	TAKEN FROM WORDPERFECT DOCUMENT 18036-95u				
	1995, MEASUREMENTS OF SCENE:				
	The reference point is GTE phone box which is on the north side of across the street from the victim's residence. The reference point "A" is at the corner of the right angle formed by the fog line and a straight line north to the phone box.				
	The reference line is laid west from the GTE box along the north edge of on the white fog line.				
	ITEM	N	E	W	S
	Right rear outside wheel of school bus			121'	
	Left front wheel of school bus	2.5"		144'	
	Inside right rear dual wheels			123'	
	Pool of blood (area of impact)			21'	8'
	Width of road outside edge fog line to fog line ----- 21'10"				
	Width of road approximately - 28'04"				
	There are no pre or post impact skid marks. There are no acceleration marks.				
	Inspection of the bus at the scene and then again the next day does not reveal any fabric impressions on the front bumper. Inspection of the undercarriage at the scene does not reveal any disturbance of the dirt grime and slush. There is no fresh ruboff inside the wheel wells on the left side of the bus. There is a noticeable difference in air pressure on the inside right rear dual tires.				
	Just west of the pool of blood, measured above, there is some blood drops or splatter with fresh slush, which appears to have come off of the mud flaps.				
	Location of the school bus tracks in the snow indicate the bus either rolled backward approximately 6-8' or it was backed up by the driver that much. This is shown in the video on the right side in front of the rear wheels. It is not as evident at the front wheels as all children were off loaded from the bus around to the front in a normal fashion across the front of the bus to their awaiting transportation.				

Continued

Incident No -I	Date & Time Reported 1995	Offense: 9300-1 ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE
-------------------	------------------------------	---

N
A
R
R
A
T
I
V
E

TOT Prosecutor's office to be reviewed with other reports.

RESPECTFULLY SUBMITTED,

BADGE

Continued

Incident No	Date & Time Reported	Offense: 9300-1
	1995 15:36	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE

N TAKEN FROM WORDPERFECT DOCUMENT 18036-95S

A R/O responded to the scene of a reported school bus/pedestrian

R accident. Upon my arrival, I made a general scene overview, and

R interviewed a witness identified as R/O

A interviewed in my marked patrol unit at the scene.

T

I indicated that he was the first vehicle behind the

V school bus, which was facing westbound on He

E indicates that he only saw one child cross the road to the south

side of and did not see any other child get off. He

thought that the child that he saw was wearing a blue jacket, but

was not sure. He then observed the school bus moving and then saw

something pink under the rear left wheel of the bus. He stated

that it looked like a doll laying there after the school bus moved.

He indicates that he did not believe that the child was drug by the

bus, but that it just rolled over the child. He indicates that the

school bus stopped in front of the driveway of the residence, and

he observed the lights being turned off on the bus. The sign on

the left side of the bus had folded in and the bus took off. He

indicates that when he saw the pink under the back wheel, he first

thought it might be a pink blanket coming from the wheels. He

indicates that he believes that the victim's mother was in the

front yard at that time, and stated that she came out to the road

quickly. By the time he got out of his vehicle, the victim's

mother met him at the victim's body. This interview took place at

approximately on 1995, at the accident

scene.

While at the scene, I assigned to assist me with

measurements. These measurements were recorded by

and will be submitted in a separate supplemental report. The

school bus involved in the accident, was secured by R/O. R/O

then assigned to assist another driver from the

to remove the bus from the scene and take

it to the west lot where it will

be held for inspection by an officer from the

Police,

R/O photographed the bus at the scene, and a video of the bus at

the scene was made by After the bus was removed

from the scene, the area of impact was cleared by some citizens.

R/O then went to the victim's residence, where I spoke to the

victim's mother. She identified the victim as

with a date of birth of 90. The mother gave her name as

and the father's name as They

reported that they have lived at this residence for about five

years, and that the bus stop has been there at the home for that

amount of time.

The parents reported that on this date, one of their sons stayed

home from school due to an illness. They advised that the bus

Continued

SHERIFF'S OFFICE

BEST AVAILABLE

Incident No	Date & Time Reported	Offense: 9300-1
	1995 15:36	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE

N usually makes the stop at their residence between 3:30 and 3:40
 A P.M. indicated that today, she was standing in her
 R dining room window watching the bus stop to drop the children off.
 R She advised that she saw her son, get off of the bus and
 A come across the street into the yard. She then observed the victim
 T coming across in front of the bus, walking near the bumper. As she
 I was about in the middle of the front of the bus, the bus began to
 V roll forward. She advised that she screamed something to her son
 E in the house, and then saw the bus roll over the victim with the
 left front wheel. She then ran out the door toward the street.

In speaking with I was unable to determine whether or not
 she saw the bus run over the victim with the left rear wheel,
 however R/O believes that she was on her way out of the residence
 during the time that this occurred. R/O was not able to ask her
 any further questions at this time to pinpoint exactly what she saw
 after that, due to her condition after having learned of the
 victim's death.

Upon my return to the Sheriff's Department, I was given the names
 of two witnesses who had not been interviewed at the scene, those
 identified as and That information was
 given to Dep. who interviewed the witnesses the following
 day, and their statements are contained in his original written
 report.

When R/O arrived at the scene of this accident, I approached from
 the east and parked my squad car on the north side of Hwy.,
 just east of the impact point. I observed a pool of blood in the
 roadway and the Public School bus parked at an angle
 about 100' west of the pool of blood. I was informed at that time
 that the school bus had run over a child by Dep. and that
 the bus driver was over on the north side of the road. A subject
 was attending to the bus driver, who was hysterical at that time.
 Two officers then put the bus driver in the rear of one of the
 squad cars to attempt to further attend to her. A second ambulance
 was called from to transport the bus driver to
 Hospital.

R/O then assisted the second school bus that came to the scene in
 getting past the accident scene and pull up in front of the suspect
 bus. The children remaining on the bus were unloaded from the
 suspect bus and into the other bus. R/O then proceeded to take
 measurements of the scene which were recorded by Dep.
 Dep. was the officer on the other end of the tape, who
 placed the tape at the various points that were measured, at R/O's
 direction.

On 1995, at 8:20 A.M., R/O contacted the
 of the State Police and requested to speak with
 I spoke with him and we made arrangements to inspect the
 school bus, which was now located in the west lot of the Sheriff's

Continued

SHERIFF'S OFFICE

Incident No	Date	Time Reported	Offense: 9300-1
	1995	15:36	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE

N Department. On that date it took several hours to inspect the
 A driver's records at the School bus garage and the bus
 R itself at the Sheriff's Department. Please see Officer
 R supplemental report regarding his findings on the
 A inspection of the bus. That report will include the mechanical
 T inspection of the brakes, etc., on the bus, including the placement
 I of the mirrors of the bus. R/O measured the position of the seat.
 V The front of the undepressed driver's seat was 11" from the right
 E side of the plastic dash, just to the right of the steering column
 at the bottom. The distance from the board behind the seat to the
 front of the seat was approximately 24". The undepressed seat
 height measured in the center from floorboard to the top of the
 seat was approximately 18 3/4". From the seat, being left in that
 position, and controls not being moved from other than the driver
 to move the bus back to impound, photographs were taken again by
 Dep. of views out of the front window of the bus, as well
 as through the rearview and convex mirrors on the front of the bus.
 Video was taken of the views from those mirrors from the driver's
 seat, the view out the driver's seat. Photographs and video were
 also taken of view down the sides of the bus and from the front of
 the bus. R/O also assisted Officer in the placement of
 cones in front of the school bus, which he measured and has
 recorded, and will submit a supplement as to the visibility study
 we conducted on the mirrors on the bus. Officer indicated
 that the positioning of the mirrors were not in conformance with
 specifications that have been established for school buses. He
 will provide further information on that in his supplement.

Basically, Officer findings were the same as those R/O
 conducted at the scene, that one could not see well enough from the
 mirrors mounted on the front of the bus on the fenders to see what
 is actually in front of the school bus where pedestrians would be
 crossing when they get out of the bus. The mirrors were not in
 compliance.

The driver of the bus, indicated on her pre-trip
 inspection that the mirrors were okay. There is no evidence that
 she found them not to be in proper operation. She indicates that
 they were all right on her morning trip and on the afternoon trip.
 This information was indicated on a clipboard that was found in the
 driver's compartment of the bus, and has been confiscated and
 placed into evidence at the Sheriff's Department.

Upon my inspection of the mirrors on the front of the bus located
 on the fenders, I noted that damage has occurred to both the left
 front and right front fenders. Specifically, the right front
 fender has damage to the mirror, and one support arm has been bowed
 and compressed so that it is not at its full length. I also
 noticed that the mirrors were not adjusted so that they lean out in
 front of the bus, as R/O understands that they are supposed to be.

Based on the conversation R/O had with Officer I found that

Incident No	Date & Time Reported 1995 15:36	Offense: 9300-1 ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE
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TOT Prosecutor's office for review.

RESPECTFULLY SUBMITTED,

SGT. BADGE
COUNTY SHERIFF'S DEPT.

Continued

SHERIFF'S OFFICE

Incident No	Date & Time Reported	Offense: 9300-1
	1995 15:36	ACCIDENT, TRAFFIC (ALL MOTOR VEHICLE

N TAKEN FROM WORDPERFECT DOCUMENT 95018036.001

A Following is witness statement reference Acct. Rept.

R

R

A R/O interviewed witness, she stated that on the
T above incident she was the driver of the first vehicle east bound
I stopped for the bus. She stated that she was not looking at the
V bus at the time and that she was adjusting mirrors as she was
E driving her husband to the dentist office. Ms. stated that
she heard her husband yell that little girl has just been hit, and
as she looked up she saw the bus rear tires run over the little
girl and she stated at that time the mother ran out of the house
and other people jumped out of their vehicles, and had no other
information reference to this report. She stated that she did not
see the little girl get hit by the bus first, as she only saw the
rear tire when her husband had yelled, and she has no other further
information.

Respectfully submitted,

Deputy

Co. Sheriff Dept.

COUNTY SHERIFF DEPARTMENT

SUPPLEMENTAL REPORT TO SCHOOL BUS ACCIDENT. REPORT #

ON THE AFTERNOON OF 96 SGT MET WITH

DIRECTOR OF OPERATIONS

SCHOOL DISTRICT

REGIONAL TRANSPORTATION AND SAFETY INSTITUTE
ROAD

TX
FX

DURING THE MEETING WITH MR WAS GIVEN COPIES OF INSTRUCTIONAL MATERIAL USED IN A CONTINUING EDUCATION CLASS FOR SCHOOL BUS DRIVERS ON 95. THERE ARE THREE PAGES CONSISTING OF INFORMATION ON FMSS 111- MIRROR SYSTEMS, MIRROR AND MIRROR ADJUSTMENTS, AND LOCATION OF TEST CYLINDERS FOR SCHOOL BUS FIELD OF VIEW TEST.

MR ALSO PROVIDED ME WITH COPIES OF THE STUDENT SIGN IN SHEET FOR BOTH THE AM AND PM SESSIONS THAT CLEARLY SHOW SIGNING BOTH SHEETS. THESE SIGN IN SHEETS ARE TWO PAGES EACH.

THE FINAL TEST SCORE SHEET ALSO INCLEDED SHOWS THAT RECEIVED A PERFECT SCORE OF 30.

THE FINAL TEST IS ALSO INCLUDED AND IS LABELED TEST "A"

INDICATED THE INSTRUCTOR FOR THIS CLASS WAS

A SCHOOL BUS DRIVER WORKBOOK HAS BEEN INCLUDED ALONG WITH THE ANSWERS THAT WERE GONE OVER IN CLASS REGARDING BUS STOP PROCEDURES.

ON PAGE 25 IS ANALYSIS #13. THE INSTRUCTOR READS THE CORRECT ANSWER AFTER STUDENTS HAVE FILLED IN THEIR RESPONSES. THE RESPONSE TO ANALYSIS #13 IS " COUNT AND TRACK EACH STUDENT UNTIL THEY ARE SAFELY AWAY FROM THE BUS. BE ESPECIALLY ALERT FOR CHILDREN YOU HAVE TRACKED MOVING ALONGSIDE OF THE BUS. IF A CHILD DROPS SOMETHING, HE OR SHE MAY BEND DOWN OR UNDER THE BUS TO RETRIEVE IT. DO NOT MOVE YOUR BUS UNTIL ALL CHILDREN ARE ACCOUNTED FOR."

ON PAGE #28 IS ANALYSIS #16. THE RESPONSE FROM THE INSTRUCTOR MANUAL READS "THE DRIVER COULD HAVE PREVENTED THIS SITUATION BY RECHECKING THE EXACT POSITIONS OF THE STUDENTS. IT WASN'T GOOD ENOUGH JUST TO CHECK THAT THE STUDENTS WERE OUTSIDE THE BUS, THE DRIVER SHOULD HAVE BEEN CERTAIN THAT THEY WERE ALL SAFELY AWAY FROM THE BUS

COUNTY SHERIFF DEPARTMENT

SUPPLEMENTAL

PAGE 2,

95

MR AND MS. WOULD BE AVAILABLE TO TESTIFY AS TO
THE MATERIAL COVERED IN THE CLASSROOM.

MR NOTES THAT THE DRIVERS ARE TAUGHT TO DO PRE-TRIP
INSPECTIONS BASED ON 257.683 (EQUIPMENT). THEY ARE TOLD THAT THE
PRE TRIP IS REQUIRED, CONTRARY TO MR POSITION.

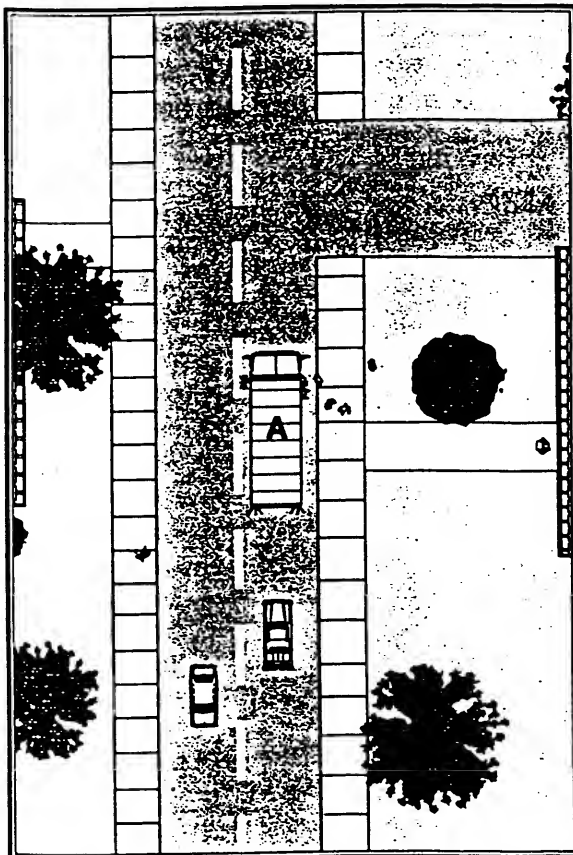
MR ALSO SAT IN THE DRIVER SEAT OF THE SCHOOL BUS IN THE
WEST LOT OF THE COUNTY SHERIFF DEPARTMENT AND WAS ASKED IF HE
COULD SEE WHAT HE WAS SUPPOSED TO SEE THRU THE CONVEX MIRRORS AND
HE INDICATED THAT HE COULD NOT.

SGT

BUS STOP PROCEDURES

Analysis #13—Workbook page 25

BEST AVAILABLE



You (A) have just stopped to discharge your passengers. You've been told to account for all the students before moving the bus. What procedure would you recommend?

Count and track each student until they are all safely away from the bus. Be especially alert for children you have tracked moving along the side of the bus. If a child drops something, he or she may bend down or under the bus to retrieve it. Do not move your bus until all children are accounted for.

While I was away from my seat, the youngster who had crossed the street returned to pick up some papers that had fallen out of a book. Unfortunately, you can guess how the situation turned out."

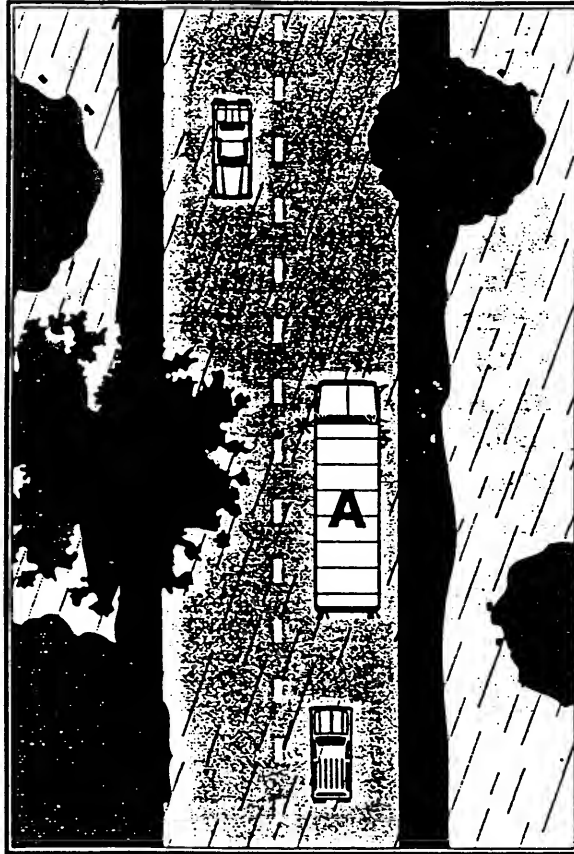
What factors contributed to this incident? How could it have been prevented?

The driver was obviously distracted by the commotion in the back of the bus and didn't *recheck* his mirrors before moving the bus. Possibly, the driver was thinking about making up the few minutes lost by the incident *on* the bus, and did not think about rechecking the area around the bus. As a bus driver responsible for the safety of each child, you must force yourself to think, "Are actions by youngsters such as this one predictable?"

[See the following page for Analysis #16]

BUS STOP PROCEDURES

Analysis #16—Workbook page 28



"I was stopped and was discharging six students. Since it was raining, I remember telling them to be careful going down the steps. All six students got off the bus, and I saw all six outside the bus. However, when I closed the door, a string from one child's rain hood got caught in the door. I traveled about 30 feet before I realized it."

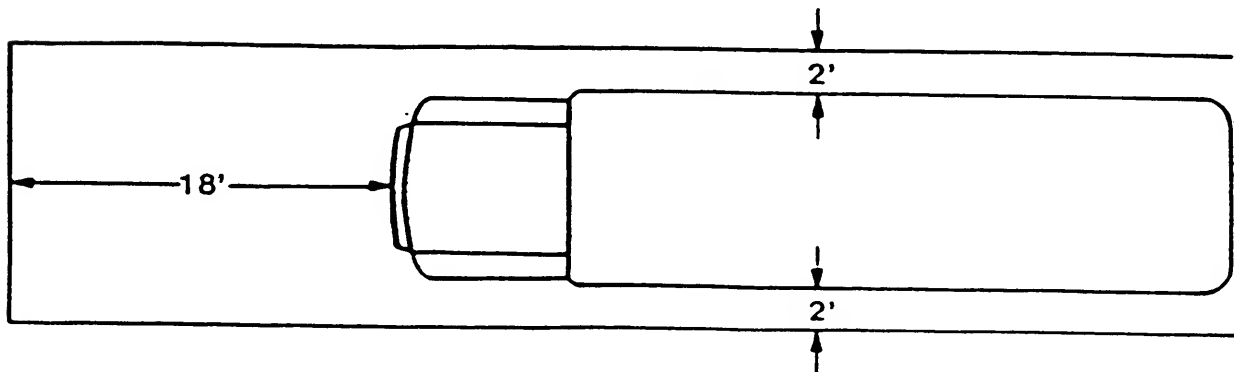
How could this situation have been prevented?

The driver could have prevented this situation by rechecking the exact positions of the students. It wasn't good enough just to check that the students were outside the bus, the driver should have been certain that they were all safely *away from* the bus.

Mirror and Mirror Adjustments

School buses must be equipped with mirrors so the driver in the **normal seated position** either by **direct vision** or by use of an **indirect mirror system** must be able to observe an object **on the roadway** in front of and on the sides of the vehicle inside a **continuously visible rectangle** which includes the **length of the vehicle plus not less than 18 feet** in front of the vehicle and the **width of the vehicle plus not less than 2 feet** on each side of the vehicle.

REQUIRED FIELD OF VIEW



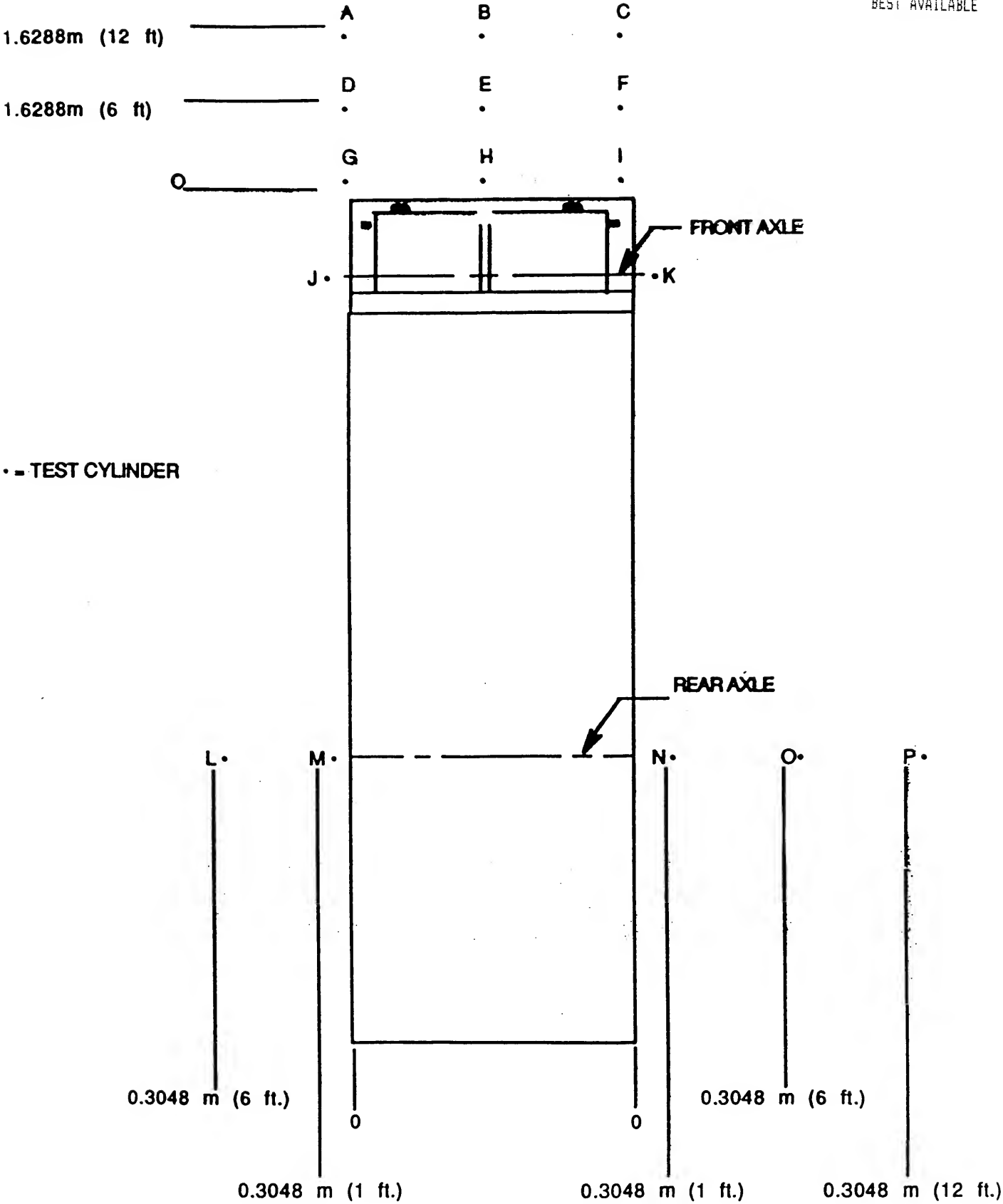
FMVSS 111 -

The New Rule Does . . .

- Become effective 1993
- Apply to all school buses
- Require that drivers be capable of viewing, either directly or indirectly, critical areas around the bus through system A (rearview) and system B (crossview) mirrors
- Require that mirrors meet standards for image clarity

Require that mirror systems be installed with stable supports

- Require that final stage manufacturer test and certify through photography the mirror system's ability to be adjusted to view cylinders placed at certain locations
(see chart on following page)
- Require that mirror test cylinders be a specific size
(1' dia. x 1' high for cylinders A through O and
1' dia. x 3' high for cylinder P)



• - TEST CYLINDER

Location of Test Cylinders for School Bus Field-of-View Test

STATE POLICE BUS INSPECTION REPORT

Department of
State Police
ORIGINAL INCIDENT
REPORT Page 1

ORIGINAL DATE 1995	INCIDENT NO. -95
TIME RECEIVED 08:15A	FILE CLASS

WORK UNIT		COUNTY	
COMPLAINANT SGT.		TELEPHONE NO.	
ADDRESS: STREET AND NO.	CITY	STATE	ZIP
INCIDENT STATUS 7 TOT OTHER POLICE DEPARTMENT			

NATURE OF INCIDENT

TRAFFIC CRASHINFORMATION:

The undersigned received a request from Sgt. Co. Sheriff Dept. to assist him in an inspection and investigation of a school bus that was involved in a fatality.

TIME AND DATE:

The call was received at 8:15 A on 1995. Arrangements were made to meet at the Co. Sheriff Dept. at 10:00 A to inspection of the bus involved at their parking lot.

ADDITIONAL INFORMATION:

Sgt. Advised me of the precautions that were taken to insure that the vehicle was not altered nor any evidence tampered with in any way. The vehicle was driven with a officer to observe that nothing was altered and taken to the lot to be secured.

DRIVERS FILE AUDIT:

After meeting with Sgt we went to the Transportation Dept. of the Public School to conduct a drivers file audit to insure that the driver possessed and the school was maintained a file of all the necessary school bus drivers credentials. A copy of that audit will be submitted with this report. It was detected that the driver physical certificate was issued the date of the exam 95) and the physical form was dated for the date that the doctor filled out the form 95). This was confirmed by calling the doctor office and them explaining the reasons for the different dates on the various statements resulting from the physical exam. The drivers file was complete and accurate otherwise.

PAGE	INVESTIGATED BY	REPORTED BY	REVIEWED BY
1	VEH. INSP.		

ORIGINAL INCIDENT
REPORT Page 2

1995	050 - 350-95
TIME RECEIVED 08:15A	FILE CLASS

VEHICLE INFORMATION:

The vehicle involved was a 1981 Ford , Wayne bodied School Bus with a chassis assembly date of 9 - 1980, The bus was numbered #11 belonging to the Public Schools. The plate that this vehicle was bearing was 343 X 06 and the VIN The bus is painted Chrome Yellow with Black trim in compliance with Michigan specification for school buses.

VEHICLE INSPECTION:

A standard school bus inspection was conducted to inspect all the components that are required under Law . The only defect found and noted were;

1. The stop arm occasionally failed to move from the side of the bus when the red overhead lights were activated.
2. Slight wear was detected at the steering knuckle end of the draglink.
3. The right rear inside tire was flat (2 psi.)
4. The right front convex mirror brackets were bent, (preexisting impact damage).
5. Both front convex mirror were position so that they were viewing more of the side of the bus than the front as their design and law require.
6. The left rear view (west coast) mirror was position to where it was improperly adjusted and difficult to use.
7. Alternator belts were loose.

The results of the inspection are recorded on . The overall mechanical condition was sufficient and well maintained for a vehicle of this high mileage. A more involved inspection was then conducted to insure documentation of all tire pressure and thread depth. The brake strokes were physically measured and various additional information gathered to satisfy the Motor Carrier Enforcement Accident Investigation worksheet and insure documentation of all pertinent information.

MIRROR INSPECTION:

As a result of the vehicle inspection a condition was exposed that the mirror adjustment at the front of the vehicle provided a very limited view to the frontal area of the vehicle. We the made a effort to establish the dimensions of the field of vision that the cross view mirrors offered at the front of the vehicle. We then placed pylons in line with the left front tire and established a minimum and maximum field of vision for each mirror at the front of the vehicle. It was observed that the placement and adjustment of these cross view mirrors provided a greater field of vision down each side of the vehicle than across the front of the vehicle as they were intended. It was also observed that the left rear view mirror was hidden behind the left windshield pillar and adjusted so that the left side of the vehicle was not visible without achieving a very unnatural head position.

PAGE	INVESTIGATED BY	REPORTED BY	REVIEWED BY
2	VEH. INSP.		

Department of
State Police

ORIGINAL INCIDENT
REPORT Page 3

ORIGINAL DATE 1995	INCIDENT NO. 95
TIME RECEIVED 08:15A	FILE CLASS

CONCLUSION:

If this vehicle was involved in an annual inspection at the time that I viewed it and the condition recorded on the MC-35 were found it would have been prevented from transporting any passengers until items 4-E, 27-B+D, 27-C+D, and 31-K, had all been corrected. The other would have been brought to the attention of the repair staff so they could monitor these condition and repair them when needed.

If the driver of this vehicle would have conducted a thorough post trip inspection as per Federal Motor Carrier Safety Regulations, parts 396, Specifically sec. No. 396.1, scope 396.11, Report and equipment required to be inspected. Or if the driver would have conducted a thorough pre trip inspection as suggested by of Education and Public School policy, the defects that I found should have been observed and corrected prior to the vehicle being placed into service. This driver has received training on how to conduct a pre trip inspection and the required field of vision that the vehicle mirror system is to provide as required per 257.1823 sec.23.

I feel that the diminished vision provided by the mirror system was not the primary cause of this accident but it may be reasonably considered a contributing factor.

FINAL DISPOSITION:

Closed.

PAGE 3	INVESTIGATED BY VEH. INSP	REPORTED BY	REVIEWED BY
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MSP RANDOM DRIVER FILE CHECK

SCHOOL DISTRICT

Driver Name

Driver License Number & (DOB)

Inspector & RDFC Date

C	5	Public Schools
O	3	
D	7	
E	6	52 / 95

REQUIRED ITEMS

CDL (Commercial Driver License)

Temporary Instruction Permit

Temporary Operators Permit

Physicians Certification Card/Form

CEC (Course Enrollment Card)

CCC (Course Completion Card)

CCE (Certificate of Continuing Education)

Criminal Record Check 90)

Drug/Alcohol Test

Employment Application 90)

✓

COMMENTS

✓	C, B, P, None	97
✓	95 form / card	95
✓	95 95 to	97

OTHER INFORMATION

Certificate of Road Test

Other

Other

Other

REMARKS

MOTOR CARRIER DRIVER/EQUIPMENT WORKSHEET

BEST AVAILABLE

OFFICER:	COMPLAINT#:	FILE CLASS:
DATE: 75	LOCATION: Co Sheriff Dept	YR: 81 MK: Ford CLR: chrome yellow
TYPE: School Bus	REG: 343206	V.I.N. 1F0WJ74 GVWR:
CARRIER/OWNER:	public Schools	

LIGHTING/FRONT: LEFT: RIGHT:

headlamps _____

turn signal _____

clearance/i.d. cl _____ i.d. _____ i.d. _____ i.d. _____ cl _____

LIGHTING/REAR: all lights operational

brake _____

tail _____

turn signal _____

clearance/i.d. cl _____ i.d. _____ i.d. _____ i.d. _____ cl _____

REAR END PROTECTION:

required: _____ condition: slight dent center of bumper

WINDSHIELD: LEFT: RIGHT:

glass _____ all glass intact

wipers _____ center: _____

defrosters _____ wiper defroster

mirrors _____ operational

COUPLING DEVICE:

type: None defects: Equipped with mirrors adjustment properties

electrical/air connect: None

headerboard: None

SEATS: LEFT: RIGHT:

belts _____ None in service

secure _____

FLOOR:

obstructions _____

SECUREMENT/CONDITION:

AXLE STEERING INSPECTION FORM

BEST AVAILABLE

STEERING AXLE:

LEFT

RIGHT

tread depth
 tire size (factory)
 air pressure
 br. chamber size
 push rod travel
 pad thickness/drum
 lug/rims

14 1/32	suspension	15.5 1/32
9.00R20	intact	9.00R20
80 psi	brake components	80 psi
1	intact & operational	
1/2		1/2
in excess of min. standard	other steering	in excess of min. standard
Secure & present	slight wear str. knuckle and drag link	Secure & present

AXLE (DRIVE)(LIFT)

td 13/32	13/32	12/32	12/32
ts 9.00R20	9.00R20	9.00R20	9.00R20
ap 78	80	2 psi	64 psi
bcs 30/30		intact	30/30
prt 3/4		operational	3/4
pt/d in excess of min. standard	in excess of min. standard	in excess of min. standard	standard
l/r Secure & present	Secure & present	Secure & present	Secure & present

AXLE (DRIVE)(LIFT)

td			
ts			
ap			
bcs			
prt			
pt/d			
l/r			

AUI=ALL UNLESS INDICATED

INSPECTOR NUMBER		LOCATION NUMBER		SPECIAL VEHICLE		TYPE TEAM		MC-35 (5-94)		STATE OF		VEHICLE INSPECTION		NO.									
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		NAME		VEHICLE REGISTRATION		NO.											
52		5376		41		02		343 X 06		81 (9-80)		11											
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		DAY		VEH. YR.		UNIQUE VEHICLE		1 NEW 2 3RD YEAR									
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		MONTH		VEH. MK.		NO. OF INSPECTION											
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		YEAR		VEH. BODY		1 2 3 4 5											
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		INSPECTING DISTRICT		MILEAGE		STATUS											
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		1 4 7		133,840		1 RED 1											
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		2 5 8		0 1 2 3 4 5 6 7 8 9		2 YELLOW											
0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		0 1 2 3 4 5 6 7 8 9		3 6		0 1 2 3 4 5 6 7 8 9		3 PASS											
1 LIGHTS		P FLASHERS OVERHEAD		N BOOSTER		F RECAPS		B BEAM		E CREEP LAMP		B SWITCH		E OPERATION		A BODY		D GLASS		X ALTERNATOR		A LIFT DOWN SEALS	
B 10 BEAM		Q STEP		O FLUID		S WHEELS LUG NUTS		C SHOCK ABSORBERS		F MOUNTING		C LEAKAGE		F SEALS		B TRIM		E OTHER		E LOOSE		B FLOOR SEALS	
C TAIL		2 BRAKES A SERVICE		3 STEERING WHEEL PLAY STEERING		B RIMS & BUSHES		D SHOCK PIN		G OTHER		14 EMER DOOR IDENTIFICATION		16 LUSH A SIZE		21 MACHINA A NUMBERS		24 FLOORS A OPENING		F DIE COLORED		C OPER	
D PLATE		B EMERGENCY		B PITMAN ARM		C CONDITION		E U-BOLTS		A WASHDOWN WIPER TUBESIDE		B RY RAINBOW		B LOCATION		B SCHOOL DISTRICT		B COVERING		G SIZE		D OTHER	
E BRAKE		C PEDAL		C TIE RODS		D MOUNTING		F SPRINGS		B BLADE		C DIRECTION		C SECURE		22 BODY REFLECTOR CONDITION		C MOLDING		23 ELECTRICAL BATTERY SIZE		31 OTHER DRIVE SHAFT GUARD	
F BEAM INDICATOR		D AIR LEAKS		D KING PINS		E COLOR		B FUEL FILLER CAP		C OPERATION		D BUZZER		D QUANTITY		B LOOSE FENDERS		D OTHER		B BATTERY BOX		B ENGINE COMP LEAKS	
G DIRECTION SIGNAL		E DRUMS		X DRAG LINK		F OTHER		B LEAKS		D SWITCH		E HANDLE		A LOCATION		C RUST		A CONDITION		C CONDUCTS OR WOBLES		C COOLANT LEAKS	
H DASH		F LUMINGS		F WHEEL BEARING		A LEAKAGE		C ROUTING		E FLUID		F HINGES		B IDENT		D TRIM		B COVERING		D GAUGES / INSTRUMENTS		D HOOD LOCKS	
I AIR		G TANKS		G BALL JOINTS		B NOISE		D GAUGES		F TANK SIZE		G MOLDING OR SEALS		C CONTENTS		E HOLES		A MOUNTING		X ALTERNATOR BELT		E BURN LOCKS	
J OUTPUT		H VALVES		H GEAR BOX		C SMOKE		E L.P. GAS		A OPERATION		H GLASS		A TRANSMISSION		F MOUNTS		B COVERING		F ALTERNATION SIZE		F DR LEAKS	
K DRUMMER SWITCH		I MISTURE EJECTOR		A TREAD		D LENGTH		F TANK SECURE		A OUTPUT		I OTHER		B FLAGS		G FRAME		C HANGHOLES		G OTHER		G SEAT BELT	
L 4 WAY HAZARD		J GAUGES		B CUTS BRACES		E SHIELD		A WINDSHIELD		B SWITCH		15 FINE EAT A SIZE		C MARKERS		H OTHER		D OTHER		29 CRASH BARRIER		H MOTOR MOUNTS	
M INTERIOR		K LOW AIR-VAC WARNING		C ALIGNMENT		F BRACKET		B SHOE		C GUARD		B NOZZLE		A SECURE		A OPERATION		A INTERIOR		A PADDING		I SUN VISOR	
N BACKUP		L LINES HOSE		D SAFE		G OTHER		C REAR		D OBSTRUCTION		C LOCATION		B IDENT		B CONTROLS		X EXTERIOR		B LOOSE		J ROOF LIGHT	
O CLEARANCE		M COMPRESSOR		X PRESSURE		A FRONT		D DIS COLORED		13 HEATER A OPERATION		D SECURE		C CAPS		C MOLDING		X COMPLY		C OTHER		X	
3-E Slight wear str ket end of drag link - Advice / 4-E Rtr inside tire flat - Red 27-B left rear view mirror in properly Adjusted - Red / 27-C Rear view mirror stand bent, both ft convex in properly Adjusted - Red / 28-E All belts loose - Adv 31-K Stop Arm fail to cycle properly intermittently - Red																							

State Police
AUTHORITY:

COMPLIANCE: Required

PENALTY: Discontinue use of bus for transporting passengers/children

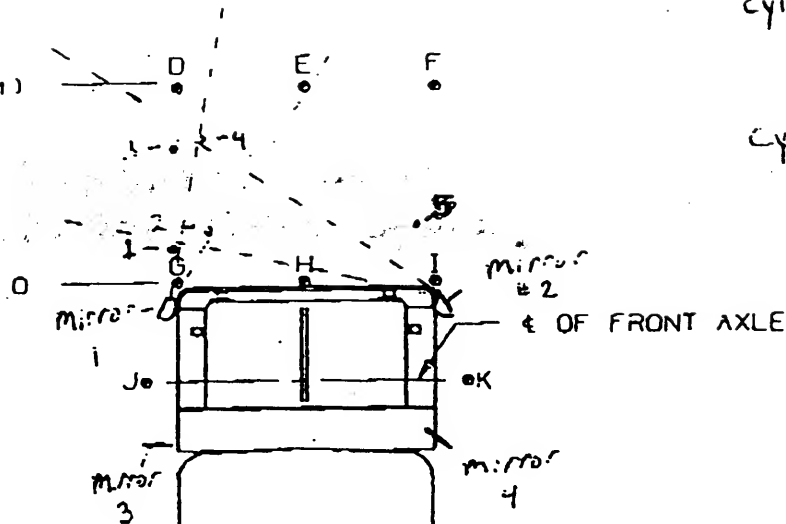
OFFICER'S SIGNATURE

1.6288m (12 ft) — A • B • C •

1.6288m (6 ft) — D • E • F •

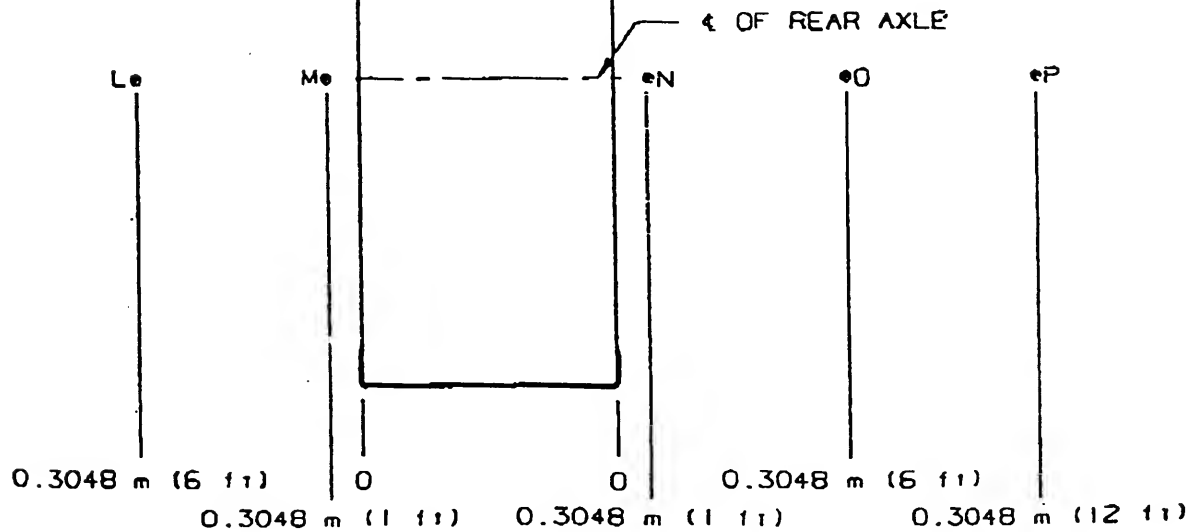
cylinder 1 & 3 min 1/2 m
mirror 2

cylinder 2 & 4 min 1/2 m
mirror 1



cylinder	1	13 1/2"	from fr. bus
"	2	26"	" " "
"	3	52"	" " "
"	4	52 1/2"	" " "
"	5	35 1/2"	" " "

• = TEST CYLINDER.



LOCATION OF TEST CYLINDERS FOR SCHOOL BUS FIELD-OF-VIEW TEST

☒ 1 N/A
☐ 2 VEH WALK AROUND
☐ 3 DRIVER ONLY

☐ 4 SPECIAL
☐ 5 TERMINAL
☐ 6

RIVER/EQUIPMENT COMPLIANCE

BEST AVAILABLE

DATE 12-18-11	MILITARY TIME 11:15A	CARRIER U.S. DOT # None	ICC # None	CITY NO .14	DIST NO .5	CARRIER <input type="checkbox"/> INTRA <input checked="" type="checkbox"/> INTER	LOC. X1	LOC. X2	LOC. X3	STATE	CLASS	INTER INTRA	LEASE
MPSC				ADDRESS									

STATE	ZIP	SHIPPER	BILL OF LADING NO.
Public Schools		ADDRESS P.O. Box	STATE/ZIP

DRIVER (FIRST, MIDDLE, LAST)	DOB	LICENSE	LIC. STATE
------------------------------	-----	---------	------------

DRIVERS LOG RECAP DATE	ON DUTY HRS	CITATIONS INCIDENTS	CITATION CODE	UNIT TYPE	YR/MAKE	UNIT NO	TRACTOR PLATE	STATE	CVSA ISSUED SELF INSP.
		1		BU	.81 Ford	#11			<input type="checkbox"/>
		2							<input type="checkbox"/>
		3							<input type="checkbox"/>
		PBT	DRUG TEST						<input type="checkbox"/>

TALS	UNIT TYPES	TR = STRAIGHT TRUCK PT = POLE TRAILER	T1 = TRUCK TRACTOR T2 = FULL TRAILER	S1 = SEMI TRAILER LC = LOCOMOTIVE CONVERTER	BU = BUS OT = OTHER
------	------------	--	---	--	------------------------

COMMODITY CODE	REPORTABLE QUANTITY	HAZARDOUS WASTE	PLACARD REQUIRED	PUSH ROD TRAVEL											
				AXLE 1	LEFT	RIGHT	AXLE 2	LEFT	RIGHT	AXLE 3	LEFT	RIGHT	AXLE 4	LEFT	RIGHT
				2	34"	34"	5			8			11		
				3			6			9			TOTAL	VIOL	O/S

VIOLATION CHECKLIST

VIO.	O/S	VIO.	O/S	VIO.	O/S	VIO.	O/S
1		23		49		73	
2		24		50		74	
3		25				75	
4		26		51		76	
5		27		52		77	
6		28		53		78	
7		29		54		79	
8		30		55		80	
9		31	VW	56		81	
10		32		57		82	
11		33	I	58		83	
12		34		59			
13		35		60		84	
14		36		61		85	
		37		62		86	
		38	I	63		87	
		39		64			
15		40		65		88	
16		41		66		89	
17		42		67		90	
18		43				91	
19		44					
20		45					
21		46					
22		47					
		48					

INCIDENTS:
 31 - Verbal warning - slight wear str knl end of drag link - VW
 33 left rear view mirror fails to view left side of vehicle - Vio
 38 Rt Rr inside tire flat - Vio
 Other violation not specifically addressed by commercial vehicle code.
 front mirrors out of proper adjustment mrc 257.1823 sec

CER SIGNATURE <input checked="" type="checkbox"/> MCO <input type="checkbox"/> TPR	WAGGE NO	MILITARY TIME (MDD)	DRIVER SIGNATURE
		.15 45p	

Part #	Description	Price
	horn	
	TYPE	
1157	Bulb	
TOTAL PARTS		

BUS # 11DATE 95

MILEAGE _____

MECHANIC _____

DISTRICT _____

CHASSIS _____ MODEL YEAR _____ CAP. _____

HRS

WORK REQUIRED

Repair windshield

Adj mirror

Replace Horn

Adj Brake

R/R FT Tire

Repair Turn Light

TOTAL HRS. x LABOR RATE \$ _____ - T. LABOR _____ TOTAL _____

257.1817 Flashing red lights; applicability of section.

Sec. 17. (1) A school bus shall be equipped with signal lamps mounted as high and widely spaced laterally as practicable which shall be capable of displaying to the front 2 alternately flashing red lights located at the same level and to the rear 2 alternately flashing red lights located at the same level. These sealed beam lights shall have sufficient intensity to be visible from a distance of not less than 500 feet in normal sunlight.

(2) Alternately flashing stop lights shall be operated by a manually operated switch and detached from any other instrument on the bus. A flashing light shall not be connected to the brakes or the service door on school buses manufactured before 1990. A 3-inch black area shall be provided around sealed beam flasher lamps front and rear. Lamps indicating alternating flashing light operation shall be visible to the driver when in a normal seated position.

(3) This section shall apply to school buses manufactured before 1990 that have not been retrofitted to meet the requirements of section 19.

257.1819 Red and amber signal lamps; applicability of section.

Sec. 19. (1) A school bus shall be equipped with signal lamps mounted as high and widely spaced laterally as practicable which shall be capable of displaying to the front 2 alternately flashing red lamps located at the same level and to the rear 2 alternately flashing red lamps located at the same level.

(2) In addition to the 4 red lamps described in subsection (1), 4 amber lamps shall be installed near each red signal lamp, at the same level, but closer to the vertical center line of the bus. The system of red and amber signal lamps shall be wired so that the amber lamps are energized manually, and the red lamps are automatically energized, with the amber lamps being automatically de-energized, when the bus service door is opened.

(3) The area around the lens of each alternately flashing signal lamp and extending outward approximately 3 inches shall be painted black in installations where there is no flat vertical portion of body immediately surrounding the entire lens of a lamp, a circular or square band of black approximately 3 inches wide, immediately below and to both sides of a lens, shall be painted on the body or roof area against which the signal lamp is seen from a distance of 500 feet along the axis of the vehicle. Visors or hoods with an appropriate black background to fit their shape and roofcap may also be used. These amber and red sealed beam lights shall have sufficient intensity to be visible from a distance of not less than 500 feet in normal sunlight. Lamps indicating alternately flashing light operation shall be visible to the driver when in a normal seated position.

(4) This section shall apply to new school buses manufactured on or after 1990 and to school buses manufactured before 1990 that are retrofitted to meet the requirements of this section.

257.1821 Windshield wipers and washers; washer reservoir; slanted windshield; safety glass.

Sec. 21. (1) A school bus shall be equipped with 2 windshield wipers and 2 windshield washers. A washer reservoir shall be 70 ounces or more.

(2) A windshield shall be slanted to prevent glare and large enough to permit the driver to see the road clearly.

(3) All glass shall be safety glass and shall comply with the requirements of section 27, where applicable.

257.1823 Vision; mirrors; sun shades; applicability.

Sec. 23. (1) A school bus or pupil transportation vehicle shall be equipped in a manner that the driver, in a normal seated position, either by direct vision or by use of an indirect vision mirror system, shall be able to observe objects on the roadway in front of and beside the vehicle located inside a continuously visible rectangular area having a length defined as the length of the vehicle plus not less than 18 feet in front of the vehicle and a width defined as the width of the vehicle plus not less than 2 feet on either side of the vehicle. A mirror used to comply with this subsection shall be at least 7-1/2 inches in diameter and convex in shape.

(2) The interior mirror shall be clear view, safety glass with a reflective surface of 6 inches in height by 30 inches in width for type I school buses, and shall be metal-backed and framed. It shall have rounded corners and padded edges. Interior mirrors for type II school buses shall have a reflective surface of 6 inches in height by 15 inches in width and shall be protected by framing and padding as for type I school buses. The interior mirror for a pupil transportation vehicle shall be as provided by the manufacturer and approved by the department of state police.

(3) Sun shades, if installed, shall be mounted so that the mounting brackets are not likely to cause injury in the event of an accident.

(4) This section does not apply to a pupil transportation vehicle other than a passenger van that is used as a pupil transportation vehicle.

Am. 1990, Act 322 (

257.1825 Fire extinguisher; first aid kit; fuses and reflectors.

Sec. 25. (1) A school bus shall be equipped with at least 1, 2A-10BC dry chemical fire extinguisher, or its equivalent, that is approved by the department of state police and that has an aluminum, brass, or bronze valve. The

GLASS - WINDOW GLAZING SHALL BE SAFETY GLASS WHICH MEANS EITHER "TEMPERED" OR "LAMINATED SAFETY PLATE." PLASTIC GLAZING MAY BE USED (VEHICLE CODE 257.711), EXCEPT IN WINDSHIELD, ONLY WHEN THE SCHOOL BUS IS EQUIPPED WITH AT LEAST ONE PUSH OUT WINDOW SASH ON EACH SIDE. GLASS TINTING IS PERMITTED IN ACCORDANCE WITH VEHICLE CODE SECTION 257.709.

HATCH - ROOF HATCH IS PERMITTED. SEALS MUST BE MAINTAINED TO PREVENT LEAKAGE OF WATER, CARBON MONOXIDE, ETC. SEALS WILL BE INSPECTED SIMILAR TO EMERGENCY DOOR SEALS. HOMEMADE AND VAN TYPE HATCHES NOT ACCEPTABLE.

HEADLIGHTS - ALTERNATELY FLASHING HEADLIGHTS ARE PERMITTED TO BE USED IN CONJUNCTION WITH RED ALTERNATELY FLASHING OVERHEAD LOADING LIGHTS.

HEATED MIRRORS - PERMITTED

HEATED WINDSHIELDS - PERMITTED.

HEATED WIPERS - PERMITTED

HEATERS (Engine Block) - FUEL FIRED ENGINE HEATERS ARE PERMITTED EXCEPT THAT LP FUEL SYSTEMS MUST BEAR A LABORATORY TEST LABEL AS REQUIRED BY STATE FIRE MARSHAL.

HEATERS (Passenger Compartment) - FUEL FIRE PASSENGER COMPARTMENT HEATERS ARE PERMITTED EXCEPT THAT LP FUEL SYSTEMS MUST BEAR A LABORATORY TEST LABEL AS REQUIRED BY THE STATE FIRE MARSHAL.

IDENTIFICATION NUMBERS - ALL NUMBERS AND LETTERING ON SCHOOL BUSES ARE PERMITTED THROUGH COOPERATION OF THE STATE DEPARTMENT OF TRANSPORTATION AND THE STATE DEPARTMENT OF EDUCATION. ADDITIONAL FLEET NUMBERS MAY BE INSTALLED IN ONE OF THE FOLLOWING LOCATIONS:

YELLOW COLOR ON FRONT BUMPER, BLACK COLOR ON LEFT FENDER BELOW THE HEADLIGHT, OR BLACK ON THE LEFT COWL.

LUGGAGE RACKS - ROOF MOUNTED LUGGAGE RACKS ARE PERMITTED. STEPS TO ACCESS THE LUGGAGE RACK ARE PERMITTED.

LUGGAGE COMPARTMENTS - UNDER BODY LUGGAGE COMPARTMENTS ARE PERMITTED.

MIRRORS - HEATED MIRRORS PERMITTED.

MOTORIZED MIRRORS PERMITTED.

ADDITIONAL INTERIOR SURVEILLANCE MIRRORS PERMITTED: PROVIDED THEY ARE FLUSH MOUNTED AND THE REFLECTIVE SURFACE IS MADE OF PLASTIC, STAINLESS STEEL OR TEMPERED GLASS. A CONVEX MIRROR MOUNTED OUTSIDE OF THE REAR EMERGENCY DOOR INTENDED TO SEE BEHIND THE SCHOOL BUS IS PERMITTED. OUTSIDE MIRRORS (WITH TWO PIECE UNIT AT LEAST 7" x 10" HORIZONTALLY AND VERTICALLY ADJUSTABLE BY DRIVER WITHOUT TOOLS ARE PERMITTED.

BANANA MIRRORS MEET THE 7 1/4 INCH DIAMETER CONVEX RULE PER ATTORNEY GENERAL OFFICE AND ARE PERMITTED.

NASS CDS ACCIDENT FORM



U.S. Department of Transportation
National Highway Traffic Safety
Administration

BEST AVAILABLE

ACCIDENT FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

<div style="display: flex; justify-content: space-between;"><div>1. Primary Sampling Unit Number <u>10</u></div><div>2. Case Number - Stratum <u>9522</u></div></div> <div style="text-align: center; background-color: black; color: white; padding: 5px; margin-top: 10px;">IDENTIFICATION</div> <div>3. Number of General Vehicle Forms Submitted <u>01</u></div> <div>4. Date of Accident (Month, Day, Year) <u> </u> <u>19</u> <u>5</u></div> <div>5. Time of Accident <u>1536</u> Code reported military time of accident. NOTE: Midnight = 2400 Unknown = 9999</div>				<div style="text-align: center; background-color: black; color: white; padding: 5px; margin-bottom: 10px;">SPECIAL STUDIES - INDICATORS</div> <div>Check (✓) each special study (SS15-SS18 below) that has been completed; code 1 for the checked special studies and 0 for the special studies not checked.</div> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"><div>6. <u> </u> SS15 Administrative Use</div><div style="text-align: right;"><u>0</u></div></div> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"><div>7. <u> </u> SS16 Pedestrian Crash Data Study <small>(Data for this special study available in a separate file.)</small></div><div style="text-align: right;"><u>0</u></div></div> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"><div>8. <u> </u> SS17 Impact Fires</div><div style="text-align: right;"><u>0</u></div></div> <div style="display: flex; justify-content: space-between; margin-bottom: 10px;"><div>9. <u> </u> SS18 Unsafe Driver Actions</div><div style="text-align: right;"><u>0</u></div></div> <div style="display: flex; justify-content: space-between;"><div>10. <u> </u> SS19 <u> </u></div><div style="text-align: right;"><u>0</u></div></div>			
<div style="text-align: center; background-color: black; color: white; padding: 5px; margin-bottom: 10px;">NUMBER OF EVENTS</div> <div>11. Number of Recorded Events in This Accident <u>03</u> Code the number of events which occurred in this accident.</div>							
ACCIDENT EVENTS							
<p>For each event that occurred in the accident, code the lowest numbered vehicle in the left columns and the other involved vehicle or object in the right columns.</p>							
Accident Event Sequence Number	Vehicle Number	Class Of Vehicle	General Area of Damage	Vehicle Number or Object Contacted	Class Of Vehicle	General Area of Damage	
12. <u>0</u> <u>1</u>	13. <u>01</u>	14. <u>50</u>	15. <u>F</u>	16. <u>72</u>	17. <u>00</u>	18. <u>0</u>	
19. <u>0</u> <u>2</u>	20. <u>01</u>	21. <u>50</u>	22. <u>F</u>	23. <u>72</u>	24. <u>00</u>	25. <u>0</u>	
26. <u>0</u> <u>3</u>	27. <u>01</u>	28. <u>50</u>	29. <u>F</u>	30. <u>72</u>	31. <u>00</u>	32. <u>0</u>	
33. <u>0</u> <u>4</u>	34. <u> </u>	35. <u> </u>	36. <u> </u>	37. <u> </u>	38. <u> </u>	39. <u> </u>	
40. <u>0</u> <u>5</u>	41. <u> </u>	42. <u> </u>	43. <u> </u>	44. <u> </u>	45. <u> </u>	46. <u> </u>	
IF GREATER THAN FIVE EVENTS, CONTINUE CODING ON THE ACCIDENT EVENT SUPPLEMENT							

CODES FOR CLASS OF VEHICLE

- | | |
|--|--|
| (00) Not a motor vehicle
(01) Subcompact/mini (wheelbase < 254 cm)
(02) Compact (wheelbase ≥ 254 but < 265 cm)
(03) Intermediate (wheelbase ≥ 265 but < 278 cm)
(04) Full size (wheelbase ≥ 278 but < 291 cm)
(05) Largest (wheelbase ≥ 291 cm)
(09) Unknown passenger car size
(14) Compact utility vehicle
(15) Large utility vehicle (≤ 4,500 kgs GVWR)
(16) Utility station wagon (≤ 4,500 kgs GVWR)
(19) Unknown utility type
(20) Minivan (≤ 4,500 kgs GVWR)
(21) Large van (≤ 4,500 kgs GVWR)
(24) Van Based school bus (≤ 4,500 kgs GVWR)
(28) Other van type (≤ 4,500 kgs GVWR)
(29) Unknown van type (≤ 4,500 kgs GVWR)
(30) Compact pickup truck (≤ 4,500 kgs GVWR) | (31) Large pickup truck (≤ 4,500 kgs GVWR)
(38) Other pickup truck (≤ 4,500 kgs GVWR)
(39) Unknown pickup truck type (≤ 4,500 kgs GVWR)
(45) Other light truck (≤ 4,500 kgs GVWR)
(48) Unknown light truck type (≤ 4,500 kgs GVWR)
(49) Unknown light vehicle type
(50) School bus (excludes van based)(> 4,500 kgs GVWR)
(58) Other bus (> 4,500 kgs GVWR)
(59) Unknown bus type
(60) Truck (> 4,500 kgs GVWR)
(67) Tractor without trailer
(68) Tractor-trailer(s)
(78) Unknown medium/heavy truck type
(79) Unknown light/medium/heavy truck type
(80) Motored cycle
(90) Other vehicle
(99) Unknown |
|--|--|

CODES FOR GENERAL AREA OF DAMAGE (GAD)

- | | | | |
|--|--|---|---|
| CDS APPLICABLE
AND OTHER
VEHICLES | (O) Not a motor vehicle
(N) Noncollision
(F) Front | (R) Right side
(L) Left side
(B) Back | (T) Top
(U) Undercarriage
(9) Unknown |
|--|--|---|---|
-
- | | | | |
|--|--|--|---|
| TDC
APPLICABLE
VEHICLES | (O) Not a motor vehicle
(N) Noncollision
(F) Front
(R) Right side | (L) Left side
(B) Back of unit with cargo area
(rear of trailer or straight truck)
(D) Back (rear of tractor) | (C) Rear of cab
(V) Front of cargo area
(T) Top
(U) Undercarriage
(9) Unknown |
|--|--|--|---|

CODES FOR VEHICLE NUMBER OR OBJECT CONTACTED

- | | |
|--|---|
| (01-30) — Vehicle Number

Noncollision
(31) Overturn — rollover (excludes end-over-end)
(32) Rollover — end-over-end
(33) Fire or explosion
(34) Jackknife
(35) Other intraunit damage (specify): _____

(36) Noncollision injury
(38) Other noncollision (specify): _____

(39) Noncollision — details unknown

Collision With Fixed Object
(41) Tree (≤ 10 cm in diameter)
(42) Tree (> 10 cm in diameter)
(43) Shrubbery or bush
(44) Embankment
(45) Breakaway pole or post (any diameter)

Nonbreakaway Pole or Post
(50) Pole or post (≤ 10 cm in diameter)
(51) Pole or post (> 10 cm but ≤ 30 cm in diameter)
(52) Pole or post (> 30 cm in diameter)
(53) Pole or post (diameter unknown)

(54) Concrete traffic barrier
(55) Impact attenuator
(56) Other traffic barrier (includes guardrail)
(specify): _____ | (57) Fence
(58) Wall
(59) Building
(60) Ditch or culvert
(61) Ground
(62) Fire hydrant
(63) Curb
(64) Bridge
(68) Other fixed object (specify): _____

(69) Unknown fixed object

Collision with Nonfixed Object
(70) Passenger car, light truck, van, or other vehicle
not in-transport
(71) Medium/heavy truck or bus not in-transport
(72) Pedestrian
(73) Cyclist or cycle
(74) Other nonmotorist or conveyance

(75) Vehicle occupant
(76) Animal
(77) Train
(78) Trailer, disconnected in transport
(79) Object fell from vehicle in-transport
(88) Other nonfixed object (specify): _____

(89) Unknown nonfixed object

(98) Other event (specify): _____
(99) Unknown event or object |
|--|---|

NASS CDS VEHICLE FORMS: CASE VEHICLE



GENERAL VEHICLE FORM

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number 10

2. Case Number - Stratum 9522

3. Vehicle Number 01

VEHICLE IDENTIFICATION

4. Vehicle Model Year 81
Code the last two digits of the model year
(99) Unknown

5. Vehicle Make (specify): 12
FORD (WAYNE BOY)
Applicable codes are found in your
NASS Data Collection, Coding and
Editing Manual.
(99) Unknown

6. Vehicle Model (specify): 981
B700
Applicable codes are found in your
NASS Data Collection, Coding and
Editing Manual.
(999) Unknown

7. Body Type 50
Note: Applicable codes may be found on
the back of this page.

8. Vehicle Identification Number

1 F D W J 7 4 N 1 B V J
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Left justify; Slash zeros and letter Z (0 and Z)
No VIN—Code all zeros Unknown—Code all nines

9. Vehicle Special Use (This Trip) 2

- (0) No special use
(1) Taxi
(2) Vehicle used as school bus
(3) Vehicle used as other bus
(4) Military
(5) Police
(6) Ambulance
(7) Fire truck or car
(8) Other (specify): _____
(9) Unknown

OFFICIAL RECORDS

10. Police Reported Vehicle Disposition 0
(0) Not towed due to vehicle damage
(1) Towed due to vehicle damage
(9) Unknown

11. Police Reported Travel Speed 999
Code to the nearest kmph (NOTE: 000 means
less than 0.5 kmph) ACCELERATING
(160) 159.5 kmph and above FROM A STOP
(999) Unknown

____ mph X 1.6093 = ____ kmph

12. Speed Limit 089
(000) No statutory limit
Code posted or statutory speed limit
in kmph
(999) Unknown

55 mph X 1.6093 = 089 kmph

13. Police Reported Alcohol Presence For Driver 0
(0) No alcohol present
(1) Yes alcohol present
(7) Not reported
(8) No driver present
(9) Unknown

14. Alcohol Test Result For Driver 97
Code actual value (decimal implied
before first digit—0.xx)
(95) Test refused
(96) None given P.B.T. = .00
(97) AC test performed, results unknown
(98) No driver present
(99) Unknown

Source: _____

15. Police Reported Other Drug Presence For Driver 7
(0) No other drug(s) present
(1) Yes other drug(s) present
(7) Not reported
(8) No driver present
(9) Unknown

16. Other Drug Specimen Test Result For Driver 9
(0) No specimen test given
(1) Drug(s) not found in specimen
(2) Drug(s) found in specimen, (specify): _____
(3) Specimen test given, results unknown or not
obtained
(8) No driver present
(9) Unknown if specimen test given

17. Driver's Zip Code _____
(00001) Driver not a resident of U.S. or territories
49112 Code actual 5-digit zip code
(99998) No driver present
(99999) Unknown

18. Driver's Race/Ethnic Origin 9
(1) White (non-Hispanic)
(2) Black (non-Hispanic)
(3) White (Hispanic)
(4) Black (Hispanic)
(5) American Indian, Eskimo or Aleut
(6) Asian or Pacific Islander
(7) Other (specify): _____
(8) No driver present
(9) Unknown

CODES FOR BODY TYPE

CDS APPLICABLE VEHICLES

Automobiles

- (01) Convertible (excludes sun-roof, t-bar)
- (02) 2-door sedan, hardtop, coupe
- (03) 3-door/2-door hatchback
- (04) 4-door sedan, hardtop
- (05) 5-door/4-door hatchback
- (06) Station wagon (excluding van and truck based)
- (07) Hatchback, number of doors unknown
- (08) Other automobile type (specify): _____

- (09) Unknown automobile type

Automobile Derivatives

- (10) Auto based pickup (includes El Camino, Caballero, Ranchero, Brat, and Rabbit pickup)
- (11) Auto based panel (cargo station wagon, auto based ambulance/hearse)
- (12) Large limousine - more than four side doors or stretched chassis
- (13) Three-wheel automobile or automobile derivative

Utility Vehicles (≤ 4,500 kgs GVWR)

- (14) Compact utility (Jeep CJ-2 - CJ-7, Scrambler, Golden Eagle, Renegade, Laredo, Wrangler, Cherokee [84 and after], Dispatcher, Raider, Bronco II, Bronco [76 and before], Explorer, S-10 Blazer, Geo Tracker, Bravada, S-15 Jimmy, Thing, Pathfinder, Trooper, Trooper II, Rodeo, Amigo, Navajo, 4-Runner, Montero, Passport, Samurai, Sidekick, Rocky)
- (15) Large utility (includes Jeep Cherokee [83 and before], Ramcharger, Trailduster, Bronco-fullsize [78 and after], fullsize Blazer, fullsize Jimmy, Hummer, Landcruiser, Rover, Scout, Yukon)
- (16) Utility station wagon (Chevy Suburban, GMC Suburban, Travelall, Grand Wagoneer, includes suburban limousine)
- (19) Utility, unknown body type

Van Based Light Trucks (≤ 4,500 kgs GVWR)

- (20) Minivan (Town and Country, Caravan, Grand Caravan, Voyager, Grand Voyager, Mini-Ram, Vista, Aerostar, Windstar, Villager, Lumina APV, Trans Sport, Silhouette, Astro, Safari, Toyota Van, Toyota Minivan, Previa, Nissan Minivan, Quest, Mitsubishi Minivan, Expo Wagon, Vanagon/Camper.)
- (21) Large van (B150-B350, Sportsman, Royal, Maxiwagon, Ram, Tradesman, Voyager [83 and before], E150-E350, Econoline, Clubwagon, Chateau, G10-G30, Chevy Van, Beauville, Sport Van, G15-G35, Rally Van, Vandura.)
- (22) Step van or walk-in van (≤ 4,500 kgs GVWR)
- (23) Van based motorhome (≤ 4,500 kgs GVWR)
- (24) Van based school bus (≤ 4,500 kgs GVWR)
- (25) Van based other bus (≤ 4,500 kgs GVWR)
- (28) Other van type (Hi-Cube Van, Kary) (specify): _____

- (29) Unknown van type

Light Conventional Trucks (Pickup style cab, ≤ 4,500 kgs GVWR)

- (30) Compact pickup (D50, Colt P/U, Ram 50, Dakota, Arrow Pickup [foreign], Ranger, Courier, S-10, T-10, LUV, S-15, T-15, Sonoma, Datsun/Nissan Pickup, P'up, Mazda Pickup, Toyota Pickup, Mitsubishi Pickup)
- (31) Large Pickup (Jeep Pickup, Comanche, Ram Pickup, D100-D350, W100-W350, F100-F350, C10-C35, K10-K35, R10-R35, V10-V35, Silverado, Sierra, R100-R500, T100)

- (32) Pickup with slide-in camper
- (33) Convertible pickup
- (39) Unknown pickup style light conventional truck type

Other Light Trucks (≤ 4,500 kgs GVWR)

- (40) Cab chassis based (includes rescue vehicles, light stake, dump, and tow truck)
- (41) Truck based panel
- (42) Light truck based motorhome (chassis mounted)
- (45) Other light conventional truck type
- (48) Unknown light truck type
- (49) Unknown light vehicle type (automobile, utility, van, or light truck)

OTHER VEHICLES

Buses (Excludes Van Based)

- (50) School bus (designed to carry students, not cross country or transit)
- (58) Other bus type (e.g., transit, intercity, bus based motorhome) (specify): _____
- (59) Unknown bus type

Medium/Heavy Trucks (> 4,500 kgs GVWR)

- (60) Step van (> 4,500 kgs GVWR)
- (61) Single unit straight truck (4,500 kgs < GVWR ≤ 8,850 kgs)
- (62) Single unit straight truck (8,850 kgs < GVWR ≤ 12,000 kgs)
- (63) Single unit straight truck (> 12,000 kgs GVWR)
- (64) Single unit straight truck, GVWR unknown
- (65) Medium/heavy truck based motorhome
- (67) Truck-tractor with no cargo trailer
- (68) Truck-tractor pulling one trailer
- (69) Truck-tractor pulling two or more trailers
- (70) Truck-tractor (unknown if pulling trailer)
- (78) Unknown medium/heavy truck type
- (79) Unknown truck type (light/medium/heavy)

Motored Cycles (Does Not Include All-Terrain Vehicles/Cycles)

- (80) Motorcycle
- (81) Moped (motorized bicycle)
- (82) Three-wheel motorcycle or moped
- (88) Other motored cycle (minibike, motorscooter) (specify): _____
- (89) Unknown motored cycle type

Other Vehicles

- (90) ATV (All-Terrain Vehicle) and ATC (All-Terrain Cycle)
- (91) Snowmobile
- (92) Farm equipment other than trucks
- (93) Construction equipment other than trucks
- (97) Other vehicle type
- (99) Unknown body type

PRECRASH ENVIRONMENTAL DATA

19. Relation To Interchange Or Junction 0
 (0) Non-interchange area and non-junction
 (1) Interchange area related

Non-Interchange junctions

- (2) Intersection related
 (3) Driveway, alley access related
 (4) Other junction (specify) _____

(5) Unknown type of junction

(9) Unknown

20. Trafficway Flow 0
 (0) Not physically divided (two way traffic)
 (1) Divided trafficway-median strip without positive barrier
 (2) Divided trafficway-median strip with positive barrier
 (3) One way traffic
 (9) Unknown

21. Number Of Travel Lanes 2
 (1) One
 (2) Two
 (3) Three
 (4) Four
 (5) Five
 (6) Six
 (7) Seven or more
 (9) Unknown

22. Roadway Alignment 1
 (1) Straight
 (2) Curve right
 (3) Curve left
 (9) Unknown

23. Roadway Profile 2
 (1) Level
 (2) Uphill grade (> 2%)
 (3) Hill crest
 (4) Downhill grade (> 2%)
 (5) Sag
 (9) Unknown

24. Roadway Surface Type 2
 (1) Concrete
 (2) Bituminous (asphalt)
 (3) Brick or block
 (4) Slag, gravel, or stone
 (5) Dirt
 (8) Other (specify): _____
 (9) Unknown

25. Roadway Surface Condition 1

- (1) Dry
 (2) Wet
 (3) Snow or slush
 (4) Ice
 (5) Sand, dirt, or oil
 (8) Other (specify): _____
 (9) Unknown

26. Light Conditions 1

- (1) Daylight
 (2) Dark
 (3) Dark, but lighted
 (4) Dawn
 (5) Dusk
 (9) Unknown

27. Atmospheric Conditions 0

- (0) No adverse atmospheric-related driving conditions
 (1) Rain
 (2) Sleet/hail
 (3) Snow
 (4) Fog
 (5) Rain and fog
 (6) Sleet and fog
 (7) Other (e.g., smog, smoke, blowing sand or dust, etc.) (specify): _____
 (9) Unknown

28. Traffic Control Device 0

- (0) No traffic control(s)
 (1) Traffic control signal (not RR crossing)

Regulatory

- (2) Stop sign
 (3) Yield sign
 (4) School zone sign
 (5) Other regulatory sign (specify): _____

- (6) Warning sign (not RR crossing)
 (7) Unknown sign
 (8) Miscellaneous/other controls including RR controls (specify): _____

(9) Unknown

29. Traffic Control Device Functioning 0

- (0) No traffic control device
 (1) Traffic control device not functioning (specify): _____
 (2) Traffic control device functioning properly
 (9) Unknown

PRECRASH DRIVER RELATED DATA

30. Driver's Distraction/Inattention To Driving 99
 (Prior To Recognition Of Critical Event)
 (00) No driver present
 (01) Attentive or not distracted
 (02) Looked but did not see
- Distractions*
 (03) By other occupant(s), (specify): _____
 (04) By moving object in vehicle (specify): _____
 (05) While talking or listening to cellular phone (specify location and type of phone): _____
 (06) While dialing cellular phone (specify location and type of phone): _____
 (07) While adjusting climate controls _____
 (08) While adjusting radio, cassette, CD (specify): _____
 (09) While using other device/object in vehicle (specify): _____
 (10) Sleepy or fell asleep
 (11) Distracted by outside person, object, or event (specify): _____
 (12) Eating or drinking
 (13) Smoking related
 (97) Distracted/inattentive, details unknown
 (98) Other, distraction (specify): _____
 (99) Unknown
31. Pre-Event Movement (Prior to Recognition of Critical Event) 04
 (00) No driver present
 (01) Going straight
 (02) Decelerating in traffic lane
 (03) Accelerating in traffic lane
 (04) Starting in traffic lane
 (05) Stopped in traffic lane
 (06) Passing or overtaking another vehicle
 (07) Disabled or parked in travel lane
 (08) Leaving a parking position
 (09) Entering a parking position
 (10) Turning right
 (11) Turning left
 (12) Making a U-turn
 (13) Backing up (other than for parking position)
 (14) Negotiating a curve
 (15) Changing lanes
 (16) Merging
 (17) Successful avoidance maneuver to a previous critical event
 (97) Other (specify): _____
 (99) Unknown
32. Critical Precrash Event 80
This Vehicle Loss of Control Due To:
 (01) Blow out or flat tire
 (02) Stalled engine
 (03) Disabling vehicle failure (e.g., wheel fell off) (specify): _____
 (04) Non-disabling vehicle problem (e.g., hood flew up) (specify): _____
 (05) Poor road conditions (puddle, pot hole, ice, etc.) (specify): _____
 (06) Traveling too fast for conditions
 (08) Other cause of control loss (specify): _____
 (09) Unknown cause of control loss

This Vehicle Traveling

- (10) Over the lane line on left side of travel lane
 (11) Over the lane line on right side of travel lane
 (12) Off the edge of the road on the left side
 (13) Off the edge of the road on the right side
 (14) End departure
 (15) Turning left at intersection
 (16) Turning right at intersection
 (17) Crossing over (passing through) intersection
 (18) This vehicle decelerating
 (19) Unknown travel direction

Other Motor Vehicle In Lane

- (50) Other vehicle stopped
 (51) Traveling in same direction with lower steady speed
 (52) Traveling in same direction while decelerating
 (53) Traveling in same direction with higher speed
 (54) Traveling in opposite direction
 (55) In crossover
 (56) Backing
 (59) Unknown travel direction of other motor vehicle in lane

Other Motor Vehicle Encroaching Into Lane

- (60) From adjacent lane (same direction)—over left lane line
 (61) From adjacent lane (same direction)—over right lane line
 (62) From opposite direction—over left lane line
 (63) From opposite direction—over right lane line
 (64) From parking lane
 (65) From crossing street, turning into same direction
 (66) From crossing street, across path
 (67) From crossing street, turning into opposite direction
 (68) From crossing street, intended path not known
 (70) From driveway, turning into same direction
 (71) From driveway, across path
 (72) From driveway, turning into opposite direction
 (73) From driveway, intended path not known
 (74) From entrance to limited access highway
 (78) Encroachment by other vehicle—details unknown

Pedestrian, Pedalcyclist, or Other Nonmotorist

- (80) Pedestrian in roadway
 (81) Pedestrian approaching roadway
 (82) Pedestrian—unknown location
 (83) Pedalcyclist or other nonmotorist in roadway (specify): _____
 (84) Pedalcyclist or other nonmotorist approaching roadway, (specify): _____
 (85) Pedalcyclist or other nonmotorist—unknown location (specify): _____

Object or Animal

- (87) Animal in roadway
 (88) Animal approaching roadway
 (89) Animal—unknown location
 (90) Object in roadway
 (91) Object approaching roadway
 (92) Object—unknown location
 (98) Other critical precrash event (specify): _____
 (99) Unknown

National Accident Sampling System-Crashworthiness Data System: General Vehicle Form

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33. Attempted Avoidance Maneuver 01

- (00) No driver present
- (01) No avoidance maneuver
- (02) Braking (no lockup)
- (03) Braking (lockup)
- (04) Braking (lockup unknown)
- (05) Releasing brakes
- (06) Steering left
- (07) Steering right
- (08) Braking and steering left
- (09) Braking and steering right
- (10) Accelerating
- (11) Accelerating and steering left
- (12) Accelerating and steering right
- (98) Other action (specify): _____

(99) Unknown

34. Pre-Impact Stability 1

- (0) No driver present
- (1) Tracking
- (2) Skidding longitudinally—rotation less than 30 degrees
- (3) Skidding laterally—clockwise rotation
- (4) Skidding laterally—counterclockwise rotation
- (7) Other vehicle loss-of-control (specify): _____

(9) Precrash stability unknown

35. Pre-Impact Location 1

- (0) No driver present
- (1) Stayed in original travel lane
- (2) Stayed on roadway but left original travel lane
- (3) Stayed on roadway, not known if left original travel lane
- (4) Departed roadway
- (5) Remained off roadway
- (6) Returned to roadway
- (7) Entered roadway
- (9) Unknown

36. Accident Type 13

(Note: Applicable codes on back of this page)

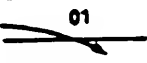



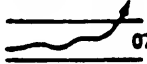

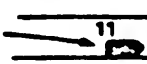

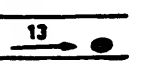
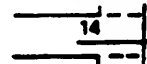
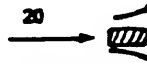
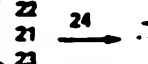
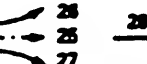

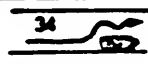
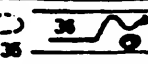
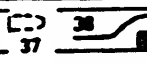
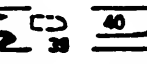
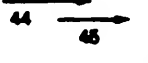
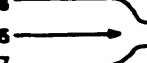


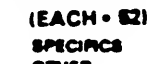




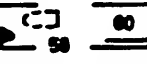

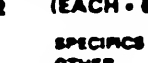


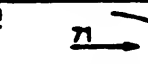

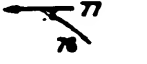


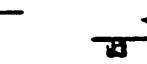
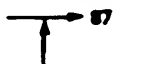

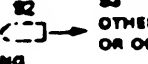

(00) No impact

Code the number of the diagram that best describes the accident circumstance

(98) Other accident type (specify): _____

(99) Unknown

STOP HERE IF GV07 DOES NOT EQUAL 01 - 49

Category	Configuration	ACCIDENT TYPES (includes Intent)				
I Single Driver	A Right Roadside Departure	 01 DRIVE OFF ROAD	 02 CONTROL/ TRACTION LOSS	 03 AVOID COLLISION WITH VEH., PED., ANIM.	04 SPECIFICS OTHER	05 SPECIFICS UNKNOWN
	B Left Roadside Departure	 06 DRIVE OFF ROAD	 07 CONTROL/ TRACTION LOSS	 08 AVOID COLLISION WITH VEH., PED., ANIM.	09 SPECIFICS OTHER	10 SPECIFICS UNKNOWN
	C Forward Impact	 11 PARKED VEH.	 12 STA. OBJECT	 13 PEDESTRIAN/ ANIMAL	 14 END DEPARTURE	15 SPECIFICS OTHER 16 SPECIFICS UNKNOWN
II Same Trafficway Same Direction	D Rear-End	 20 STOPPED 21, 22, 23	 22 SLOWER 24, 25, 27	 24 DECEL. 26, 28, 31	 26 AVOID COLLISION WITH VEH.	(EACH - 32) SPECIFICS OTHER (EACH - 33) SPECIFICS UNKNOWN
	E Forward Impact	 34 CONTROL/ TRACTION LOSS	 36 CONTROL/ TRACTION LOSS	 38 AVOID COLLISION WITH VEH.	 40 AVOID COLLISION WITH OBJECT	(EACH - 42) SPECIFICS OTHER (EACH - 43) SPECIFICS UNKNOWN
	F Sideswipe Angle	 44 LATERAL MOVE	 46 LATERAL MOVE	 48 LATERAL MOVE	(EACH - 48) SPECIFICS OTHER	(EACH - 49) SPECIFICS UNKNOWN
III Same Trafficway Opposite Direction	G Head-On	 60 LATERAL MOVE	 62 LATERAL MOVE	 64 LATERAL MOVE	(EACH - 62) SPECIFICS OTHER (EACH - 63) SPECIFICS UNKNOWN	
	H Forward Impact	 64 CONTROL/ TRACTION LOSS	 66 CONTROL/ TRACTION LOSS	 68 AVOID COLLISION WITH VEH.	 70 AVOID COLLISION WITH OBJECT	(EACH - 62) SPECIFICS OTHER (EACH - 63) SPECIFICS UNKNOWN
	I Sideswipe Angle	 64 LATERAL MOVE	 66 LATERAL MOVE	 68 LATERAL MOVE	(EACH - 66) SPECIFICS OTHER (EACH - 67) SPECIFICS UNKNOWN	
IV Change Trafficway Vehicle Turning	J Turn Across Path	 69 INITIAL OPPOSITE DIRECTIONS	 71 INITIAL SAME DIRECTIONS	 73 INITIAL SAME DIRECTIONS	(EACH - 74) SPECIFICS OTHER (EACH - 75) SPECIFICS UNKNOWN	
	K Turn Into Path	 77 TURN INTO SAME DIRECTION	 79 TURN INTO SAME DIRECTION	 81 TURN INTO OPPOSITE DIRECTIONS	 83 TURN INTO OPPOSITE DIRECTIONS	(EACH - 84) SPECIFICS OTHER (EACH - 85) SPECIFICS UNKNOWN
V Intersecting Paths (Vehicle Damage)	L Straight Paths	 87 STRAIGHT PATHS	 89 STRAIGHT PATHS	(EACH - 80) SPECIFICS OTHER	(EACH - 91) SPECIFICS UNKNOWN	
VI Miscellaneous	M Backing Etc	 92 BACKING VEH.	 93 OTHER VEH. OR OBJECT	98 Other Accident Type 99 Unknown Accident Type 00 No Impact		

OCCUPANT RELATED

37. Driver Presence in Vehicle 1
(0) Driver not present
(1) Driver present
(9) Unknown
38. Number of Occupants This Vehicle 99
(00-96) Code actual number of occupants for this vehicle
(97) 97 or more
(99) Unknown
39. Number of Occupant Forms Submitted 01

AIR BAG RELATED

40. Is this an AOPS Vehicle? 0
(0) No (includes unknown)
(1) Yes - researcher determined
(2) VIN determined air bag system
(3) VIN determined automatic (passive) belts
(4) VIN determined air bag and automatic (passive) belts
41. Air Bag(s) Deployment, First Seat Frontal 0
(0) Not equipped or not available
(1) No air bags deployed
Single Air Bag Vehicle
(2) Driver air bag deployed
(3) Driver air bag, unknown if deployed
Multiple Air Bag Vehicle
(4) Driver side only deployed
(5) Passenger side only deployed
(6) Driver and passenger side deployed
(7) Driver and passenger side unknown if deployed
(8) Air bag(s) deployed, details unknown
(9) Unknown
42. Air Bag(s) Deployment, Other Than First Seat Frontal 0
(0) Not equipped with an "other" air bag
(1) Deployed during accident (as a result of impact)
(2) Deployed inadvertently just prior to accident
(3) Deployed, details unknown
(4) Deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
(5) Unknown if deployed
(7) Nondeployed
(9) Unknown

Specify type of "other" air bag present: _____

VEHICLE WEIGHT ITEMS

43. Vehicle Curb Weight 9990
Code weight to nearest 10 kilograms.
(045) Less than 450 kilograms
(610) 6,100 kilograms or more
(999) Unknown
_____ lbs X .4536 = _____ kgs

Source: _____

44. Vehicle Cargo Weight 9990
Code weight to nearest 10 kilograms.
(000) Less than 5 kilograms
(450) 4,500 kilograms or more
(999) Unknown
_____ lbs X .4536 = _____ kgs

Source: _____

ROLLOVER DATA

45. Rollover 00
(00) No rollover (no overturning)
Rollover (primarily about the longitudinal axis)
(01-16) Code the number of quarter turns
(17) Rollover, 17 or more quarter turns (specify): _____
(98) Rollover--end-over-end (i.e., primarily about the lateral axis)
(99) Rollover (overturn), details unknown
46. Rollover Initiation Type 00
(00) No rollover
(01) Trip-over
(02) Flip-over
(03) Turn-over
(04) Climb-over
(05) Fall-over
(06) Bounce-over
(07) Collision with another vehicle
(08) Other rollover initiation type specify): _____
(98) Rollover--end-over-end
(99) Unknown rollover initiation type
47. Location of Rollover Initiation 0
(0) No rollover
(1) On roadway
(2) On shoulder--paved
(3) On shoulder--unpaved
(4) On roadside or divided trafficway median
(8) Rollover--end-over-end
(9) Unknown
48. Rollover Initiation Object Contacted 00
(Note: Applicable codes on back of page)
49. Location on Vehicle Where Initial Principal Tripping Force Is Applied 0
(0) No rollover
(1) Wheels/tires
(2) Side plane
(3) End plane
(4) Undercarriage
(5) Other location on vehicle (specify): _____
(6) Non-contact rollover forces (specify): _____
(8) Rollover--end-over-end
(9) Unknown
50. Direction of Initial Roll 0
(0) No rollover
(1) Roll right - primarily about the longitudinal axis
(2) Roll left - primarily about the longitudinal axis
(8) Rollover--end-over-end
(9) Unknown roll direction

VERRIDE/UNDERRIDE (THIS VEHICLE)

51. Front Override/Underride (this Vehicle) 0
52. Rear Override/Underride (this Vehicle) 0
- (0) No override/underride, or not an end-to-end impact between two CDS applicable vehicles, and no medium/heavy truck or bus underride

*Override (see specific CDC)**[Between 2 CDS applicable vehicles (Bodytype, GV07 = 1-49)]*

- (1) 1st CDC
- (2) 2nd CDC
- (3) Other not automated CDC (specify):

*Underride (see specific CDC)**[Between 2 CDS applicable vehicles (Bodytype, GV07 = 1-49)]*

- (4) 1st CDC
- (5) 2nd CDC
- (6) Other not automated CDC (specify):

- (7) Medium/heavy truck or bus override (of any configuration)
- (9) Unknown

HEADING ANGLE AT IMPACT FOR HIGHEST DELTA V

Values: (000)-(359) Code actual value

- (997) Noncollision
- (998) Impact with object
- (999) Unknown

53. Heading Angle For This Vehicle 9 9 8
54. Heading Angle For Other Vehicle 9 9 8

RECONSTRUCTION DATA

55. Towed Trailing Unit 0
- (0) No towed unit
- (1) Yes—towed trailing unit
- (9) Unknown
56. Documentation of Trajectory Data for This Vehicle 0
- (0) No
- (1) Yes
57. Post Collision Condition of Tree or Pole (For Highest Delta V) 0
- (0) Not collision (for highest delta V) with tree or pole
- (1) Not damaged
- (2) Cracked/sheared
- (3) Tilted < 45 degrees
- (4) Tilted ≥ 45 degrees
- (5) Uprooted tree
- (6) Separated pole from base
- (7) Pole replaced
- (8) Other (specify):
- (9) Unknown

ACCIDENT RECONSTRUCTION PROGRAMS HIGHEST DELTA V

58. Basis for Total (Resultant) Delta V (highest) 0 4

(00) No vehicle inspection

Delta V Calculated

- (01) Reconstruction program -damage only routine
- (02) Reconstruction program -damage and trajectory routine
- (03) Missing vehicle algorithm

Delta V Not Calculated

- (04) At least one vehicle (which may be this vehicle) is beyond the scope of an acceptable reconstruction program, regardless of collision conditions.

All vehicles within scope (CDC applicable) of reconstruction program but one of the collision conditions is beyond the scope of the reconstruction program or other acceptable reconstruction technique, regardless of adequacy of damage data.

- (05) Rollover
- (06) Other non-horizontal forces
- (07) Sideswipe type damage
- (08) Severe override
- (09) Yielding object
- (10) Overlapping damage
- (11) All vehicle and collision conditions are within scope of one of the acceptable reconstruction programs, but there is insufficient data available, (specify):

- (98) Other, (specify):

COMPUTER GENERATED CRASH SEVERITY

59. Total Delta V

9 9 9

____ Nearest kmph (highest)

____ Nearest kmph (secondary)

(NOTE: 000 means less than 0.5 kmph)
 (160) 159.5 kmph and above
 (999) Unknown

60. Longitudinal Component of Delta V

Highest

+ 9 9 9
- 9 9 9

____ Nearest kmph (highest)

____ Nearest kmph (secondary)

(NOTE: _000 means greater than
 -0.5 kmph and less than +0.5 kmph)
 (±160) ±159.5 kmph and above
 (_999) Unknown

61. Lateral Component of Delta V

Highest

+ 9 9 9
- 9 9 9

____ Nearest kmph (highest)

____ Nearest kmph (secondary)

(NOTE: _000 means greater than -0.5 kmph
 and less than +0.5 kmph)
 (±160) ±159.5 kmph and above
 (_999) Unknown

62. Energy Absorption

9 9 9 . 9 0 0

____ Nearest 100 joules (highest)

____ Nearest 100 joules (secondary)

(NOTE: 0000 means less than 50 joules)
 (9997) 999,650 joules or more
 (9999) Unknown

63. Impact Speed

Highest

9 9 9

____ Nearest kmph (highest)

____ Nearest kmph (secondary)

(NOTE: 000 means less than 0.5 kmph)
 (160) 159.5 kmph and above
 (998) Trajectory algorithm not run
 (999) Unknown

DELTA V CONFIDENCE LEVEL

64. Confidence In Reconstruction Program Results (For Highest Delta V)

0

- (0) No reconstruction
 (1) Collision fits model — results appear reasonable
 (2) Collision fits model — results appear high
 (3) Collision fits model — results appear low
 (4) Borderline reconstruction — results appear reasonable

OTHER SPEED ESTIMATE

65. Barrier Equivalent Speed

Highest

9 9 9

____ Nearest kmph (highest)

____ Nearest kmph (secondary)

(NOTE: 000 means less than 0.5 kmph)
 (160) 159.5 kmph and above
 (999) Unknown

IS MISSING VEHICLE ALGORITHM APPLICABLE FOR THIS VEHICLE? [] YES [✓] NO

IF YES: IS A COMPLETED PROGRAM SUMMARY INCLUDED? [] YES [] NO

ESTIMATED DELTA V	VEHICLE INSPECTION
<p>66. Estimated Highest Delta V (Researcher Determined) <u>1</u></p> <p>(0) Reconstruction Delta V coded</p> <p><i>Estimated Delta V</i></p> <p>(1) Less than 10 kmph (2) ≥ 10 kmph but < 25 kmph (3) ≥ 25 kmph but < 40 kmph (4) ≥ 40 kmph but < 55 kmph (5) ≥ 55 kmph</p> <p><i>Other estimates of damage severity</i></p> <p>(6) Minor (7) Moderate (8) Severe</p> <p>(9) Unknown</p>	<p>67. Type of Vehicle Inspection <u>3</u></p> <p>(0) No inspection (1) Vehicle fully repaired-no damage evident (2) Partial inspection (specify): (3) Complete inspection</p>

*** IF THE CDS APPLICABLE VEHICLE WAS NOT INSPECTED (I.E., GV67 = 0), ***

DO NOT COMPLETE THE EXTERIOR AND INTERIOR VEHICLE FORMS

*** IF GV07 DOES NOT EQUAL 01-49, DO NOT COMPLETE ***

THE EXTERIOR VEHICLE, INTERIOR VEHICLE,
OCCUPANT ASSESSMENT, AND OCCUPANT INJURY FORMS.

EXTERIOR VEHICLE FORM

**NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM**

1. Primary Sampling Unit Number	<u>1</u> <u>0</u>	3. Vehicle Number	<u>0</u> <u>1</u>
2. Case Number - Stratum	<u>9</u> <u>5</u> <u>2</u> <u>2</u>		

VEHICLE IDENTIFICATION

VIN 1 F S W J 7 4 N 1 B V Model Year 81
Vehicle Make (specify): Ford (Wayne Body) Vehicle Model (specify): B700

LOCATOR

Locate the end of the damage with respect to the vehicle longitudinal center line or bumper corner for end impacts or an undamaged axle for side impacts.

Specific Impact No.	Location of Direct Damage	Location of Field L	Location of Max Crush
	NO	DAMAGE	

CRUSH PROFILE IN CENTIMETERS

NOTES: Identify the plane at which the C-measurements are taken (e.g., at bumper, above bumper, at sill, above sill, etc.) and label adjustments (e.g., free space).

Measure C1 to C6 from driver to passenger side in front or rear impacts and rear to front in side impacts.

Free space value is defined as the distance between the baseline and the original body contour taken at the individual C locations. This may include the following: bumper lead, bumper taper, side protrusion, side taper, etc. Record the value for each C-measurement and maximum crush.

Use as many lines/columns as necessary to describe each damage profile.

[illegible]

ORIGINAL SPECIFICATIONS WORK SHEET

BEST AVAILABLE

Wheelbase 255.0 inches x 2.54 = 648 cm
 Overall Length 405.8 inches x 2.54 = 1,031 cm
 Maximum Width 96.0 inches x 2.54 = 244 cm
 Curb Weight _____ pounds x 0.4536 = _____ kg
 Average Track _____ inches x 2.54 = _____ cm
 Front Overhang 34.0 inches x 2.54 = 86 cm
 Rear Overhang 116.8 inches x 2.54 = 297 cm
 Undeformed End Width _____ inches x 2.54 = _____ cm
 Engine Size: cyl/displ. _____ cc x 0.001 = 8.2 L
 V8, 8.2 L
 Diesel _____ CID x 0.0164 = _____ L

SPECIAL CRASH INVESTIGATION ADDENDUM

Submodel Designation: {specify} B700 Color: {specify} YELLOW Repair Cost: \$ 0Transmission: {circle} Automatic | Manual Speed: 3-speed | 4-speed | 5-speed | Other:Steering: {circle} Power-assisted | Manual Type: rack-and-pinion | worm-and-gear | Other
{please describe}:Brakes: {circle} Power-assisted | Manual Type: 4-wheel disc | 4-wheel drum | 4-wheel hydraulic
| front disc, rear drum | Other:

Observed Defects: {specify}

Fleet Type: {circle} Private vehicle | Rental vehicle | Leased vehicle | Commercial vehicle | Other

{please describe}: OWNED BY SCHOOL CORPORATION



DAMAGE DESCRIPTION

Tire—Wheel Damage

Rotation physically restricted

RF 2 For rear wheels

LF 2 circle axle(s)

RR 2 2 3

LR 2

(1) Yes, (2) No, (8) NA, (9) Unk.

TYPE OF TRANSMISSION

Manual Automatic ☒

Front Track: UNKNOWN

Cab Width: UNKNOWN

Curb Weight: UNKNOWN

Overall Length: 1,031 cm

Wheel Base: 648 cm

Engine Size: cyl. V8

displ. 500

WHEEL STEER ANGLES

(For locked front wheels or displaced rear axles only)

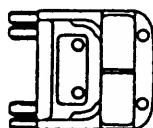
RF ± ° For rear wheels

LF ± ° circle axle(s)

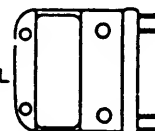
RR ± ° 2 3

LR ± °

Within ± 5 degrees

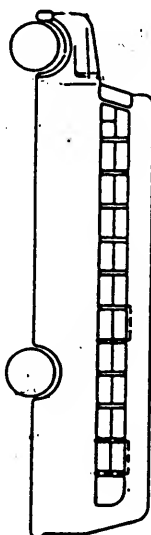


FRONT
CONVENTIONAL

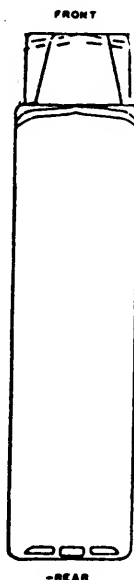


FRONT
FORWARD CONTROL

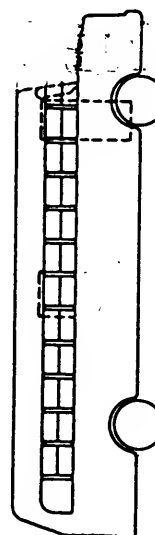
No Damage



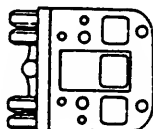
POST-CRASH



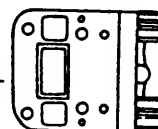
-REAR



POST-CRASH



REAR
CONVENTIONAL



REAR
FORWARD CONTROL

Note: Sketch new perimeter and cross hatch direct damage and single hatch induced damage on all views. Annotate observations which might be useful in reconstructing the accident (e.g., grass in tire bead, direction of striations, scuff on sidewall, etc.) If pulling trailer sketch type of trailer and damage received on the back of this page. Annotate any damage caused by extrication such as component removal by torching, prying or hydraulic shears. Annotate any tires which are deflated due to damage on the vehicle sketch. If the vehicle contacted a pedestrian, complete page 6R

CDC WORKSHEET

CODES FOR OBJECT CONTACTED

(01-30) – Vehicle Number

Noncollision

- (31) Overturn — rollover (excludes end-over-end)
(32) Rollover—end-over-end
(33) Fire or explosion
(34) Jackknife
(35) Other intraunit damage (specify):

(36) Noncollision injury

(38) Other noncollision (specify):

(39) Noncollision — details unknown

Collision With Fixed Object

- (41) Tree (≤ 10 cm in diameter)
(42) Tree (> 10 cm in diameter)
(43) Shrubbery or bush
(44) Embankment

(45) Breakaway pole or post (any diameter)

Nonbreakaway Pole or Post

- (50) Pole or post (≤ 10 cm in diameter)
(51) Pole or post (> 10 cm but ≤ 30 cm in diameter)
(52) Pole or post (> 30 cm in diameter)
(53) Pole or post (diameter unknown)

- (54) Concrete traffic barrier
(55) Impact attenuator
(56) Other traffic barrier (includes guardrail)
(specify):

- (57) Fence
(58) Wall
(59) Building
(60) Ditch or culvert
(61) Ground
(62) Fire hydrant
(63) Curb
(64) Bridge
(68) Other fixed object (specify):

(69) Unknown fixed object

Collision with Nonfixed Object

- (70) Passenger car, light truck, van, or other vehicle not in-transport
(71) Medium/heavy truck or bus not in-transport
(72) Pedestrian
(73) Cyclist or cycle
(74) Other nonmotorist or conveyance

(75) Vehicle occupant

(76) Animal

(77) Train

(78) Trailer, disconnected in transport

(79) Object fell from vehicle in-transport

(88) Other nonfixed object (specify):

(89) Unknown nonfixed object

(98) Other event (specify):

(99) Unknown event or object

DEFORMATION CLASSIFICATION BY EVENT NUMBER

[illegible]

COLLISION DEFORMATION CLASSIFICATION**HIGHEST DELTA "V"**

Accident Event Sequence Number	Object Contacted	(1) (2) Direction of Force	(3) Deformation Location	(4) Longitudinal or Lateral Location	(5) Vertical or Lateral Location	(6) Type of Damage Distribution	(7) Deformation Extent
4. _____	5. _____	6. _____	7. _____	8. _____	9. _____	10. _____	11. _____

Second Highest Delta "V"

12. _____	13. _____	14. _____	15. _____	16. _____	17. _____	18. _____	19. _____
-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------

CRUSH PROFILE IN CENTIMETERS

The crush profile for the damage described in the CDC(s) above should be documented in the appropriate space below. (ALL MEASUREMENTS ARE IN CENTIMETERS.)

HIGHEST DELTA "V"

20. _____ L	21. _____ C ₁	_____ C ₂	_____ C ₃	_____ C ₄	_____ C ₅	_____ C ₆	22. _____ ± D
							+
							-

Second Highest Delta "V"

23. _____ L	24. _____ C ₁	_____ C ₂	_____ C ₃	_____ C ₄	_____ C ₅	_____ C ₆	25. _____ ± D
							+
							-

26. Undeformed End Width
(Coded when highest severity impact is an end plane impact.) 999
_____ Code to the nearest centimeter
(250) 250 centimeters or more
(998) No highest severity end plane impact
(999) Unknown

27. Direct Damage Width
(For highest severity impact) 999
_____ Code to the nearest centimeter
(250) 250 centimeters or more
(999) Unknown

28. Original Wheelbase 648 Code to the nearest centimeter 648
(650) 650 centimeters or more
(999) Unknown
255.0 inches X 2.54 = 648 centimeters

29. Original Average Track Width 999
_____ Code to the nearest centimeter
(185) 185 centimeters or more
(999) Unknown
_____ inches X 2.54 = _____ centimeters

**NASS CDS INTERVIEW FORM:
CASE VEHICLE DRIVER**



INTERVIEW FORM (A)

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number 10

Interviewee(s) Role or Name(s): Bus Driver

2. Case Number - Stratum 9522

3. Vehicle Number 01

Phone number: _____

Review all available information and interview questions prior to conducting interview(s) to ensure the acquisition of all pertinent data.

If the driver was not the person interviewed, was an appointment made for a follow-up interview?

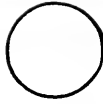
DRIVER'S DESCRIPTION OF ACCIDENT EVENTS

BUS DRIVER'S ATTORNEY REFUSED PERMISSION FOR AN
INTERVIEW.

OCCUPANT'S DESCRIPTION OF ACCIDENT EVENTS

SPECIFIC QUESTIONS TO ASK INTERVIEWEE

ACCIDENT DIAGRAM



NORTH

Use this diagram to aid in relating interviewee accident trajectory data (i.e., pre-impact to FRP orientations) to identifiable objects in the environment.

CRASH DATA INFORMATION**IF POSSIBLE OBTAIN THIS INFORMATION FROM THE DRIVER:**

SOURCE OF INFORMATION:	<input type="checkbox"/> Driver <input type="checkbox"/> Other occupant <input type="checkbox"/> Relative/friend
TRAVEL DIRECTION?	<input type="checkbox"/> North <input type="checkbox"/> South <input type="checkbox"/> East <input type="checkbox"/> West (Or where were they coming from or going to?)
LANE?	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> Other Note: lane 1 is the right curb lane
ROAD CONDITION?	<input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Snow <input type="checkbox"/> Slush <input type="checkbox"/> Ice <input type="checkbox"/> Sand, dirt, oil <input type="checkbox"/> Other (specify)
WEATHER CONDITIONS? (Check all that apply)	<input type="checkbox"/> No adverse conditions <input type="checkbox"/> Rain <input type="checkbox"/> Fog <input type="checkbox"/> Sleet <input type="checkbox"/> Hail <input type="checkbox"/> Snow <input type="checkbox"/> Other (specify)
SIGN OR SIGNAL PRESENT? (check all that apply)	<input type="checkbox"/> Traffic control signal (includes flashing beacons, lane control signals, and green / amber / red signal) <input type="checkbox"/> Stop sign <input type="checkbox"/> Yield sign <input type="checkbox"/> School zone sign <input type="checkbox"/> Other regulatory sign (No "U" turn, left turn only, wrong way, etc.) specify: _____ <input type="checkbox"/> Warning sign (Winding road sign, stop ahead, intersection signs, etc.) specify: _____ <input type="checkbox"/> Miscellaneous control (including railroad controls) specify: _____ <input type="checkbox"/> None <input type="checkbox"/> Unknown
WAS THE CONTROL FUNCTIONING PROPERLY?	<input type="checkbox"/> No traffic control device present <input type="checkbox"/> Not functioning properly (includes defaced, badly worn, covered with snow, rotated etc.) specify: _____ <input type="checkbox"/> Functioning properly <input type="checkbox"/> Unknown
SPEED BEFORE THE IMPACT? (in mph)	<input type="checkbox"/> Stopped <input type="checkbox"/> 11-20 <input type="checkbox"/> 31-40 <input type="checkbox"/> 51-60 <input type="checkbox"/> 70+ <input type="checkbox"/> 1-10 <input type="checkbox"/> 21-30 <input type="checkbox"/> 41-50 <input type="checkbox"/> 61-70 <input type="checkbox"/> Unknown
BEFORE IMPACT, INTENDING TO ... ? (check all that apply)	<input type="checkbox"/> Go straight <input type="checkbox"/> Stopped <input type="checkbox"/> Turn left <input type="checkbox"/> Turn right <input type="checkbox"/> Slow down <input type="checkbox"/> Accelerate <input type="checkbox"/> Back up <input type="checkbox"/> Change lanes to right <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Change lanes to left
CONTROL LOSS DUE TO WEATHER OR MECHANICAL PROBLEMS?	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes (describe)
AVOIDANCE ACTIONS?	<input type="checkbox"/> None <input type="checkbox"/> Braking with lock-up <input type="checkbox"/> Accelerating <input type="checkbox"/> Unknown <input type="checkbox"/> Braking without lock-up <input type="checkbox"/> Steering left <input type="checkbox"/> Other- specify: _____ <input type="checkbox"/> Releasing brakes <input type="checkbox"/> Steering right
LOCATION OF VEHICLE AT TIME OF IMPACT?	<input type="checkbox"/> Original travel lane <input type="checkbox"/> Different travel lane <input type="checkbox"/> In intersection <input type="checkbox"/> Off roadway to right <input type="checkbox"/> Off roadway to left <input type="checkbox"/> Other (specify): _____
SPEED AT THE TIME OF IMPACT? (in mph)	<input type="checkbox"/> Stopped <input type="checkbox"/> 11-20 <input type="checkbox"/> 31-40 <input type="checkbox"/> 51-60 <input type="checkbox"/> 70+ <input type="checkbox"/> 1-10 <input type="checkbox"/> 21-30 <input type="checkbox"/> 41-50 <input type="checkbox"/> 61-70 <input type="checkbox"/> Unknown
DESCRIBE ALL THE IMPACTS to the vehicle and how this vehicle moved to its stopped position, after the collision?	

VEHICLE INFORMATION**ROLLOVER DATA**

DID THIS VEHICLE ROLL OVER DURING THE CRASH?

☐ YES -- ASK THE FOLLOWING QUESTIONS ☐ NO -- SKIP TO "FIRE DATA" BELOW
☐ UNKNOWN -- SKIP TO "FIRE DATA" BELOW

ROLLOVER BEGAN	<input type="checkbox"/> On roadway <input type="checkbox"/> On shoulder <input type="checkbox"/> On roadside or median <input type="checkbox"/> Unknown
ROLLOVER CAUSE?	<input type="checkbox"/> Other vehicle (specify vehicle number) _____ <input type="checkbox"/> Contact to object (specify): _____ <input type="checkbox"/> Other cause (specify): _____ <input type="checkbox"/> Unknown
DIRECTION OF VEHICLE ROLL?	<input type="checkbox"/> Toward the right (passenger side) <input type="checkbox"/> Toward the left (driver side) <input type="checkbox"/> End-over-end <input type="checkbox"/> Unknown
NUMBER OF TURNS	_____ Number of QUARTER TURNS <input type="checkbox"/> Unknown _____ Number of COMPLETE TURNS
PLANE IN CONTACT WITH GROUND AT FINAL REST?	<input type="checkbox"/> Left side <input type="checkbox"/> Top <input type="checkbox"/> Right side <input type="checkbox"/> Wheels <input type="checkbox"/> Unknown

FIRE DATA

DID THIS VEHICLE EXPERIENCE A FIRE?

☐ YES -- ASK THE FOLLOWING QUESTIONS ☐ NO -- SKIP THIS SECTION
☐ UNKNOWN -- SKIP THIS SECTION

FIRE STARTED, OR SMOKE WAS FIRST SEEN ...	<input type="checkbox"/> Under the hood <input type="checkbox"/> In the trunk/cargo area <input type="checkbox"/> Behind the instrument panel <input type="checkbox"/> Under the vehicle <input type="checkbox"/> In the passenger compartment <input type="checkbox"/> From other involved vehicle <input type="checkbox"/> Unknown
FIRE START WITH THE ELECTRICAL SYSTEM? <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> Yes (specify): _____
FIRE START WITH THE FUEL SYSTEM? <input type="checkbox"/> No <input type="checkbox"/> Unknown	<input type="checkbox"/> Yes -- specify Which part of the fuel system may have been involved? <input type="checkbox"/> Fuel tank <input type="checkbox"/> Fuel lines <input type="checkbox"/> Engine compartment (specify component if known) <input type="checkbox"/> Unknown

Describe any additional rollover or fire information here:



ADDITIONAL VEHICLE INFORMATION

YEAR, MAKE AND MODEL?	Year: 19 ____ Make: _____ Model: _____
PREVIOUS OR POST-CRASH DAMAGE?	<input type="checkbox"/> No <input type="checkbox"/> Yes - describe: <input type="checkbox"/> Unknown
DOORS OR HATCH OPEN DURING THE CRASH?	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> LF <input type="checkbox"/> RF <input type="checkbox"/> LR <input type="checkbox"/> RR <input type="checkbox"/> HATCH <input type="checkbox"/> OTHER _____ <input type="checkbox"/> Unknown
WINDOWS BREAK DURING THE CRASH?	<input type="checkbox"/> No Check all that apply <input type="checkbox"/> Yes <input type="checkbox"/> WS <input type="checkbox"/> LF <input type="checkbox"/> RF <input type="checkbox"/> LR <input type="checkbox"/> RR <input type="checkbox"/> BL <input type="checkbox"/> Roof <input type="checkbox"/> Other _____ <input type="checkbox"/> Unknown
WINDOW PRECRASH STATUS	<input type="checkbox"/> WS <input type="checkbox"/> LF <input type="checkbox"/> RF <input type="checkbox"/> LR <input type="checkbox"/> RR <input type="checkbox"/> BL <input type="checkbox"/> Roof <input type="checkbox"/> Other _____ "O" = open "C" = Closed "P" = partially open "U" = Unknown
GLOVE COMPARTMENT DOOR OPEN DURING THE CRASH?	<input type="checkbox"/> No <input type="checkbox"/> Yes - describe: <input type="checkbox"/> Unknown
CARGO IN THE VEHICLE?	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - describe: Approximate weight - _____ pounds
VEHICLE MILEAGE	_____ miles <input type="checkbox"/> Unknown
IF VEHICLE HAS NOT BEEN INSPECTED	Current location of the vehicle: _____ _____ Contact person: _____
Detail any notes, questions to ask interviewee (i.e., rescue personnel damage to vehicle) or directions to vehicle location:	

SPECIAL CRASH INVESTIGATION ADDENDUM: DRIVER INFORMATION	
Do you recall the type of development in the area of the crash?	<input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Undeveloped <input type="checkbox"/> School <input type="checkbox"/> Other: _____
What were the weather conditions at the time of the crash?	<input type="checkbox"/> Clear (no clouds, no precipitation) <input type="checkbox"/> Cloudy (partially cloudy, no precipitation) <input type="checkbox"/> Overcast (full cloud cover, no precipitation) <input type="checkbox"/> Precipitating <input type="checkbox"/> Unknown
What was the type of precipitation?	<input type="checkbox"/> No precipitation <input type="checkbox"/> Unknown <input type="checkbox"/> Raining <input type="checkbox"/> Freezing rain <input type="checkbox"/> Sleet <input type="checkbox"/> Snowing <input type="checkbox"/> Hailing
What was the condition of the road surface?	<input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Snowy, slushy <input type="checkbox"/> Icy <input type="checkbox"/> Other (e.g., sand, dirt, oil on surface, etc.) <input type="checkbox"/> Unknown
How would you describe the amount of traffic at the time of the crash?	<input type="checkbox"/> Heavy <input type="checkbox"/> Moderate <input type="checkbox"/> Light <input type="checkbox"/> No other traffic present
What is your occupation?	<input type="checkbox"/> Professional <input type="checkbox"/> Technical <input type="checkbox"/> Government official <input type="checkbox"/> Management <input type="checkbox"/> Proprietors <input type="checkbox"/> Sales <input type="checkbox"/> Clerical <input type="checkbox"/> Craftsman and foreman <input type="checkbox"/> Service worker <input type="checkbox"/> Student <input type="checkbox"/> Farmers and farm-managers <input type="checkbox"/> Farm labors and foreman <input type="checkbox"/> Private household worker <input type="checkbox"/> Housewife <input type="checkbox"/> Other: _____
How long have you driven this vehicle?	Years: _____ Months: _____
How many miles do you think that you have driven it in the last 12-month period?	Miles: _____
How often do you drive this particular roadway?	<input type="checkbox"/> Daily <input type="checkbox"/> Twice weekly <input type="checkbox"/> Once weekly <input type="checkbox"/> Twice monthly <input type="checkbox"/> Once monthly <input type="checkbox"/> Very infrequently <input type="checkbox"/> First time on road
Where were you coming from just prior to the crash?	<input type="checkbox"/> Home <input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Shopping <input type="checkbox"/> Social/recreational <input type="checkbox"/> Restaurant <input type="checkbox"/> Personal business <input type="checkbox"/> Other: _____
Where were you intending to go when the crash occurred?	<input type="checkbox"/> Home <input type="checkbox"/> Work <input type="checkbox"/> School <input type="checkbox"/> Shopping <input type="checkbox"/> Social/recreational <input type="checkbox"/> Restaurant <input type="checkbox"/> Personal business <input type="checkbox"/> Other: _____

OCCUPANT DATA QUESTIONS

HOW MANY PEOPLE WERE IN THE VEHICLE AT THE TIME OF THE CRASH?

	DRIVER	OCCUPANT # ____	OCCUPANT # ____
SEATING POSITION? Front Left (FL) Second Left (2L) Front Middle (FM) Second Middle (2M) Front Right (FR) Second Right (2R) Third Left (3L) Other (SPECIFY in block) Third Middle (3M) Third Right (3R)	FRONT LEFT		
SEX, HEIGHT, WEIGHT, AND AGE? CIRCLE DRIVER'S RACE: White Black American Indian Eskimo or Aleut Asian or Pacific Islander Other (specify): Unknown	<input type="checkbox"/> M <input type="checkbox"/> F - Not pregnant <input type="checkbox"/> F - Pregnant - # of months ____ <input type="checkbox"/> F - Unk. if pregnant HEIGHT: ____ WEIGHT: ____ AGE: ____ DRIVER OF HISPANIC ORIGIN? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> U	<input type="checkbox"/> M <input type="checkbox"/> F - Not pregnant <input type="checkbox"/> F - Pregnant - # of months ____ <input type="checkbox"/> F - Unk. if pregnant HEIGHT: ____ WEIGHT: ____ AGE: ____ 	<input type="checkbox"/> M <input type="checkbox"/> F - Not pregnant <input type="checkbox"/> F - Pregnant - # of months ____ <input type="checkbox"/> F - Unk. if pregnant HEIGHT: ____ WEIGHT: ____ AGE: ____ 
OCCUPANT POSTURE A) Kneeling or standing on seat B) Lying on or across seat C) Kneeling, standing or sitting in front of seat D) Sitting sideways, turned to side or back E) Sitting on console F) Lying back in reclined position G) Other (specify) H) Unknown	<input type="checkbox"/> Leaning to left <input type="checkbox"/> Leaning to right <input type="checkbox"/> Sitting upright <input type="checkbox"/> Unknown Indicate all letters that apply and describe if other than above	<input type="checkbox"/> Leaning to left <input type="checkbox"/> Leaning to right <input type="checkbox"/> Sitting upright <input type="checkbox"/> Unknown Indicate all letters that apply and describe if other than above	<input type="checkbox"/> Leaning to left <input type="checkbox"/> Leaning to right <input type="checkbox"/> Sitting upright <input type="checkbox"/> Unknown Indicate all letters that apply and describe if other than above
FEET AND HANDS/ARMS LOCATION JUST PRIOR TO IMPACT <u>FEET</u> A) On floor or foot controls B) One or both on dash C) One or both on seat D) Other (specify) E) Unknown <u>HANDS / ARMS</u> F) Both hands on steering wheel G) One on wheel, other hand resting or adjusting a control (specify hand on wheel and control involved) H) Dialing a cellular phone (specify location and type of phone) I) Holding a cellular phone (specify location and type of phone) J) Bracing with one or both hands K) On lap L) One or both out of window (specify) M) Other (specify) N) Unknown	Indicate all letters that apply and further describe as needed	Indicate all letters that apply and further describe as needed	Indicate all letters that apply and further describe as needed

OCCUPANT DATA CONTINUED ON NEXT PAGE

OCCUPANT DATA QUESTIONS (continued)

	DRIVER	OCCUPANT # ____	OCCUPANT # ____																																																						
BACK UP AGAINST THE SEAT BACK?	<input type="checkbox"/> No (describe) <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No (describe) <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No (describe) <input type="checkbox"/> Yes <input type="checkbox"/> Unknown																																																						
ADJUSTABLE SEAT TRACK, IF "YES" WHERE WAS THE TRACK PRIOR TO IMPACT?	<input type="checkbox"/> Not adjustable <input type="checkbox"/> Seat all the way forward <input type="checkbox"/> Between forward and middle <input type="checkbox"/> At middle position <input type="checkbox"/> Between middle and rear position <input type="checkbox"/> Seat all the way rearward <input type="checkbox"/> Unknown	<input type="checkbox"/> Not adjustable <input type="checkbox"/> Seat all the way forward <input type="checkbox"/> Between forward and middle <input type="checkbox"/> At middle position <input type="checkbox"/> Between middle and rear position <input type="checkbox"/> Seat all the way rearward <input type="checkbox"/> Unknown	<input type="checkbox"/> Not adjustable <input type="checkbox"/> Seat all the way forward <input type="checkbox"/> Between forward and middle <input type="checkbox"/> At middle position <input type="checkbox"/> Between middle and rear position <input type="checkbox"/> Seat all the way rearward <input type="checkbox"/> Unknown																																																						
ADJUSTABLE SEAT BACK, IF "YES" WHERE WAS THE BACK PRE AND POST IMPACT	<table border="0"> <tr> <td><u>PRE</u></td> <td><u>POST</u></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	<u>PRE</u>	<u>POST</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<table border="0"> <tr> <td><u>PRE</u></td> <td><u>POST</u></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	<u>PRE</u>	<u>POST</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<table border="0"> <tr> <td><u>PRE</u></td> <td><u>POST</u></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	<u>PRE</u>	<u>POST</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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TILT STEERING COLUMN ADJUSTMENT PRIOR TO IMPACT

<input type="checkbox"/> Not adjustable	<input type="checkbox"/> Full up	<input type="checkbox"/> Between full up and center
<input type="checkbox"/> Center	<input type="checkbox"/> Between center and full down	
<input type="checkbox"/> Full down	<input type="checkbox"/> Unknown	

TELESCOPING STEERING COLUMN PRIOR TO IMPACT

<input type="checkbox"/> Not adjustable	<input type="checkbox"/> Full back	<input type="checkbox"/> Between full back and midpoint
<input type="checkbox"/> Midpoint	<input type="checkbox"/> Between midpoint and full forward	
<input type="checkbox"/> Full forward	<input type="checkbox"/> Unknown	

Did this vehicle have a cellular phone in it during the crash?

- ☐ No
☐ Yes - describe type: _____
 (e.g., portable, mounted in vehicle, flip phone, etc.)
☐ Unknown

(Note to researcher: try to determine any driver distractions without implying fault)

Was the driver doing any of the following? (check all that apply - and specify)

- ☐ Talking to or listening to another occupant (specify):
☐ Was there a moving object in vehicle (specify):
☐ Talking or listening on a cellular phone (specify):
☐ Dialing a cellular phone (specify):
☐ Adjusting climate control (specify):
☐ Adjusting radio, CD or cassette player (specify):
☐ Using other device or object in vehicle (specify):
☐ Sleepy / asleep (specify):
☐ Distracted by outside person, object, or event (specify):
☐ Eating or drinking (specify):
☐ Smoking related (specify):
☐ Other (specify):
☐ Unknown

RESTRAINT INFORMATION

	DRIVER	OCCUPANT # ____	OCCUPANT # ____
TYPE OF SEAT BELT AVAILABLE NOTE: If a belt is not available for a seat position -- describe reason	<input type="checkbox"/> Unknown <input type="checkbox"/> Lap belt <input type="checkbox"/> Shoulder belt <input type="checkbox"/> Lap & Shoulder <input type="checkbox"/> Not available * * Describe:	<input type="checkbox"/> Unknown <input type="checkbox"/> Lap belt <input type="checkbox"/> Shoulder belt <input type="checkbox"/> Lap & Shoulder <input type="checkbox"/> Not available * * Describe:	<input type="checkbox"/> Unknown <input type="checkbox"/> Lap belt <input type="checkbox"/> Shoulder belt <input type="checkbox"/> Lap & Shoulder <input type="checkbox"/> Not available * * Describe:
DO BELTS MOVE ALONG A MOTORIZED TRACK FOR THIS SEAT? (i.e., 2-point automatic belt)	<input type="checkbox"/> Unknown <input type="checkbox"/> No <input type="checkbox"/> Yes *	<input type="checkbox"/> Unknown <input type="checkbox"/> No <input type="checkbox"/> Yes *	<input type="checkbox"/> Unknown <input type="checkbox"/> No <input type="checkbox"/> Yes *
* IF "YES", WERE THEY WORKING PROPERLY?	<input type="checkbox"/> Yes <input type="checkbox"/> No (describe)	<input type="checkbox"/> Yes <input type="checkbox"/> No (describe)	<input type="checkbox"/> Yes <input type="checkbox"/> No (describe)
ARE ANY BELTS ATTACHED TO THE DOOR? (i.e., 3-point automatic belt)	<input type="checkbox"/> Unknown <input type="checkbox"/> No <input type="checkbox"/> Yes *	<input type="checkbox"/> Unknown <input type="checkbox"/> No <input type="checkbox"/> Yes *	<input type="checkbox"/> Unknown <input type="checkbox"/> No <input type="checkbox"/> Yes *
* IF "YES", DOES IT CROSS:	<input type="checkbox"/> Chest <input type="checkbox"/> Lap <input type="checkbox"/> Both	<input type="checkbox"/> Chest <input type="checkbox"/> Lap <input type="checkbox"/> Both	<input type="checkbox"/> Chest <input type="checkbox"/> Lap <input type="checkbox"/> Both
OCCUPANT WEARING ANY SEATBELT?	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown
SKIP THE FOLLOWING IF NO SEAT BELT WAS WORN			
TYPE OF BELT WORN?	<input type="checkbox"/> Lap belt <input type="checkbox"/> Shoulder belt <input type="checkbox"/> Lap & Shoulder <input type="checkbox"/> Unknown	<input type="checkbox"/> Lap belt <input type="checkbox"/> Shoulder belt <input type="checkbox"/> Lap & Shoulder <input type="checkbox"/> Unknown	<input type="checkbox"/> Lap belt <input type="checkbox"/> Shoulder belt <input type="checkbox"/> Lap & Shoulder <input type="checkbox"/> Unknown
LAP BELT SITUATED?	<input type="checkbox"/> Low on lap <input type="checkbox"/> Across stomach <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> Low on lap <input type="checkbox"/> Across stomach <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> Low on lap <input type="checkbox"/> Across stomach <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown
SHOULDER BELT SITUATED?	<input type="checkbox"/> Over shoulder <input type="checkbox"/> Under the arm <input type="checkbox"/> Behind back <input type="checkbox"/> Behind seat <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> Over shoulder <input type="checkbox"/> Under the arm <input type="checkbox"/> Behind back <input type="checkbox"/> Behind seat <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> Over shoulder <input type="checkbox"/> Under the arm <input type="checkbox"/> Behind back <input type="checkbox"/> Behind seat <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown
Describe any breaks, tears, or failures to any of the seat belts:			

EJECTION, ENTRAPMENT, MOBILITY INFORMATION

	DRIVER	OCCUPANT # ____	OCCUPANT # ____
ANY PART OF BODY THROWN OUTSIDE THE VEHICLE DURING THE CRASH?	<input type="checkbox"/> No <input type="checkbox"/> Yes * <input type="checkbox"/> Unknown * If "Yes" - what part(s) were ejected, and what area of the vehicle was involved.	<input type="checkbox"/> No <input type="checkbox"/> Yes * <input type="checkbox"/> Unknown * If "Yes" - what part(s) were ejected, and what area of the vehicle was involved.	<input type="checkbox"/> No <input type="checkbox"/> Yes * <input type="checkbox"/> Unknown * If "Yes" - what part(s) were ejected, and what area of the vehicle was involved.
ANYONE PINNED IN THE VEHICLE?	<input type="checkbox"/> No <input type="checkbox"/> Yes ____ physically pinned ____ jammed doors ____ fire, etc. <input type="checkbox"/> Unknown Detail any entrapment	<input type="checkbox"/> No <input type="checkbox"/> Yes ____ physically pinned ____ jammed doors ____ fire, etc. <input type="checkbox"/> Unknown Detail any entrapment	<input type="checkbox"/> No <input type="checkbox"/> Yes ____ physically pinned ____ jammed doors ____ fire, etc. <input type="checkbox"/> Unknown Detail any entrapment
HOW DID OCCUPANT(S) EXIT THE VEHICLE?	<input type="checkbox"/> Fatal before removed <input type="checkbox"/> Removed while unconscious, or not oriented to time or place <input type="checkbox"/> Removed due to perceived serious injuries <input type="checkbox"/> Exited with some assistance <input type="checkbox"/> Exited under own power <input type="checkbox"/> Fully ejected <input type="checkbox"/> Unknown	<input type="checkbox"/> Fatal before removed <input type="checkbox"/> Removed while unconscious, or not oriented to time or place <input type="checkbox"/> Removed due to perceived serious injuries <input type="checkbox"/> Exited with some assistance <input type="checkbox"/> Exited under own power <input type="checkbox"/> Fully ejected <input type="checkbox"/> Unknown	<input type="checkbox"/> Fatal before removed <input type="checkbox"/> Removed while unconscious, or not oriented to time or place <input type="checkbox"/> Removed due to perceived serious injuries <input type="checkbox"/> Exited with some assistance <input type="checkbox"/> Exited under own power <input type="checkbox"/> Fully ejected <input type="checkbox"/> Unknown
Further describe any ejection, entrapment, or mobility information here:			

AIR BAG INFORMATION

WAS THIS VEHICLE EVER EQUIPPED WITH AN AIR BAG?

☐ YES (IF "YES" COMPLETE THIS SECTION)☐ NO ☐ UNKNOWN (IF "NO" OR "UNKNOWN" SKIP THIS SECTION)

	DRIVER SIDE FRONTAL	PASSENGER SIDE FRONTAL OCCUPANT # ____	"OTHER" AIR BAG SPECIFY: _____ OCCUPANT # ____
VEHICLE BEEN IN ANY PREVIOUS CRASHES? <input type="checkbox"/> NO <input type="checkbox"/> YES - continue to right <input type="checkbox"/> UNKNOWN - go to box below	<input type="checkbox"/> Prior crash <u>without</u> deployment <input type="checkbox"/> One prior crash <u>with</u> deployment <input type="checkbox"/> > 1, <u>with</u> at least one deployment <input type="checkbox"/> Previous accident(s) unknown if deployed <u>IF PRIOR DEPLOYMENT</u> <input type="checkbox"/> CHECK IF <u>NOT</u> REINSTALLED	<input type="checkbox"/> Prior crash <u>without</u> deployment <input type="checkbox"/> One prior crash <u>with</u> deployment <input type="checkbox"/> > 1, <u>with</u> at least one deployment <input type="checkbox"/> Previous accident(s) unknown if deployed <u>IF PRIOR DEPLOYMENT</u> <input type="checkbox"/> CHECK IF <u>NOT</u> REINSTALLED	<input type="checkbox"/> Prior crash <u>without</u> deployment <input type="checkbox"/> One prior crash <u>with</u> deployment <input type="checkbox"/> > 1, <u>with</u> at least one deployment <input type="checkbox"/> Previous accident(s) unknown if deployed <u>IF PRIOR DEPLOYMENT</u> <input type="checkbox"/> CHECK IF <u>NOT</u> REINSTALLED
TYPE OF AIR BAG?	<input type="checkbox"/> Original equipment <input type="checkbox"/> Retrofitted <input type="checkbox"/> Replacement <input type="checkbox"/> Unknown	<input type="checkbox"/> Original equipment <input type="checkbox"/> Retrofitted <input type="checkbox"/> Replacement <input type="checkbox"/> Unknown	<input type="checkbox"/> Original equipment <input type="checkbox"/> Retrofitted <input type="checkbox"/> Replacement <input type="checkbox"/> Unknown
PRIOR SERVICE ON THE AIR BAG SYSTEM?	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:
DID AIR BAG INFLATE DURING THIS CRASH?	<input type="checkbox"/> Yes <input type="checkbox"/> Unknown <input type="checkbox"/> No If "NO" was the wiring disconnected prior to the crash? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	<input type="checkbox"/> Yes <input type="checkbox"/> Unknown <input type="checkbox"/> No If "NO" was the wiring disconnected prior to the crash? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk	<input type="checkbox"/> Yes <input type="checkbox"/> Unknown <input type="checkbox"/> No If "NO" was the wiring disconnected prior to the crash? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk
WAS THIS PERSON WEARING ANY TYPE OF EYE-WEAR (EYE/ SUNGLASSES OR CONTACT LENSES) ANY JEWELRY, OR HAVE ANY OBJECTS IN MOUTH OR HAND?	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:
WAS THE AIR BAG IN THIS POSITION CONTACTED BY ANOTHER OCCUPANT?	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:	<input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes - Specify:

Describe any additional information here:

CHILD SAFETY SEAT INFORMATION**WAS THERE A PERSON IN A CHILD SAFETY SEAT IN THIS VEHICLE?**☐ YES (IF "YES" COMPLETE THIS SECTION)☐ NO ☐ UNKNOWN (IF "NO" OR "UNKNOWN" SKIP THIS SECTION)

	DRIVER	OCCUPANT # ____	OCCUPANT # ____
MAKE AND MODEL OF THE SAFETY SEAT?			
TYPE OF SEAT?		<input type="checkbox"/> Infant <input type="checkbox"/> Toddler <input type="checkbox"/> Convertible <input type="checkbox"/> Booster <input type="checkbox"/> Integral <input type="checkbox"/> Other Specify: _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> Infant <input type="checkbox"/> Toddler <input type="checkbox"/> Convertible <input type="checkbox"/> Booster <input type="checkbox"/> Integral <input type="checkbox"/> Other Specify: _____ <input type="checkbox"/> Unknown
DIRECTION FACING PRIOR TO THE CRASH?		<input type="checkbox"/> Front <input type="checkbox"/> Rearward <input type="checkbox"/> Unknown	<input type="checkbox"/> Front <input type="checkbox"/> Rearward <input type="checkbox"/> Unknown
VEHICLE'S SEAT BELT USED TO HOLD THE SEAT IN PLACE?		<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown
HOW WAS THE VEHICLE'S SEAT BELT SECURED TO THE CHILD SEAT?		<input type="checkbox"/> Looped through designated rear framing studs <input type="checkbox"/> Looped through arm rest slots <input type="checkbox"/> Belt across safety shield <input type="checkbox"/> Looped through rear frame outside the designated framing struts <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> Looped through designated rear framing studs <input type="checkbox"/> Looped through arm rest slots <input type="checkbox"/> Belt across safety shield <input type="checkbox"/> Looped through rear frame outside the designated framing struts <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown
WHAT WAS THE CHILD SEAT EQUIPPED WITH AT TIME OF PURCHASE?		<input type="checkbox"/> Harness <input type="checkbox"/> Shield <input type="checkbox"/> Tether <input type="checkbox"/> Unknown	<input type="checkbox"/> Harness <input type="checkbox"/> Shield <input type="checkbox"/> Tether <input type="checkbox"/> Unknown
ANY OF THESE ADDED AFTER THEY OWNED THE SAFETY SEAT?		<input type="checkbox"/> Harness <input type="checkbox"/> Shield <input type="checkbox"/> Tether <input type="checkbox"/> None <input type="checkbox"/> Unknown	<input type="checkbox"/> Harness <input type="checkbox"/> Shield <input type="checkbox"/> Tether <input type="checkbox"/> None <input type="checkbox"/> Unknown

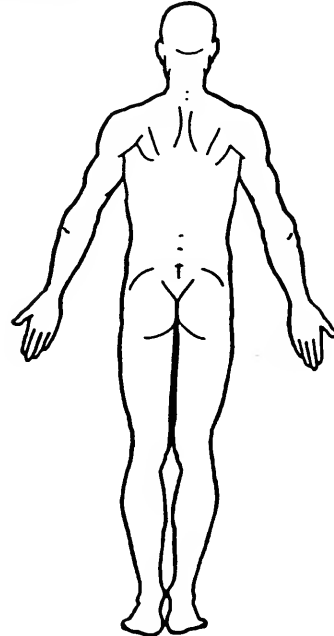
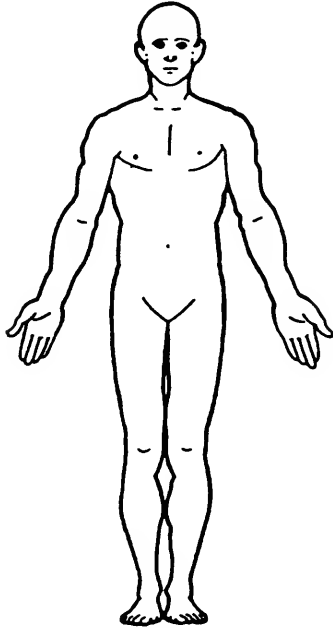
Describe any additional information here:

INJURY INFORMATION

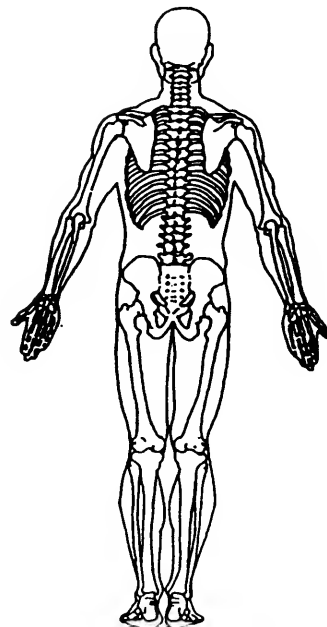
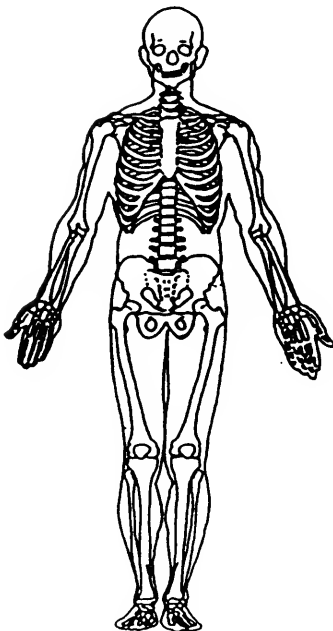
	DRIVER	OCCUPANT # ____	OCCUPANT # ____
WERE YOU INJURED? ▶ If "YES" go to manikin page and record injuries in detail ▶ If "NO" ask next questions	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown
DID YOU HAVE ANY OF THE FOLLOWING: <i>(If any injuries are checked, go to the manikin page and record location, lesion, and source)</i>	<input type="checkbox"/> Cuts <input type="checkbox"/> Abrasions <input type="checkbox"/> Bruises <input type="checkbox"/> Broken bones <input type="checkbox"/> Head, skull, brain <input type="checkbox"/> Internal injury <input type="checkbox"/> Sprains, strains <input type="checkbox"/> Other - specify on manikin	<input type="checkbox"/> Cuts <input type="checkbox"/> Abrasions <input type="checkbox"/> Bruises <input type="checkbox"/> Broken bones <input type="checkbox"/> Head, skull, brain <input type="checkbox"/> Internal injury <input type="checkbox"/> Sprains, strains <input type="checkbox"/> Other - specify on manikin	<input type="checkbox"/> Cuts <input type="checkbox"/> Abrasions <input type="checkbox"/> Bruises <input type="checkbox"/> Broken bones <input type="checkbox"/> Head, skull, brain <input type="checkbox"/> Internal injury <input type="checkbox"/> Sprains, strains <input type="checkbox"/> Other - specify on manikin
TRANSPORTED DIRECTLY FROM ACCIDENT SCENE FOR TREATMENT?	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown
RECEIVE ANY MEDICAL TREATMENT? (check all that apply)	<input type="checkbox"/> Hospital <input type="checkbox"/> Medical clinic <input type="checkbox"/> Paramedics at scene <input type="checkbox"/> Doctor's office <input type="checkbox"/> Treated by self <input type="checkbox"/> Unknown	<input type="checkbox"/> Hospital <input type="checkbox"/> Medical clinic <input type="checkbox"/> Paramedics at scene <input type="checkbox"/> Doctor's office <input type="checkbox"/> Treated by self <input type="checkbox"/> Unknown	<input type="checkbox"/> Hospital <input type="checkbox"/> Medical clinic <input type="checkbox"/> Paramedics at scene <input type="checkbox"/> Doctor's office <input type="checkbox"/> Treated by self <input type="checkbox"/> Unknown
HOSPITALIZED?	<input type="checkbox"/> No <input type="checkbox"/> Yes - # of days _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes - # of days _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes - # of days _____ <input type="checkbox"/> Unknown
TREATED AND RELEASED FROM THE EMERGENCY ROOM?	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Unknown
NAME OF MEDICAL TREATMENT FACILITY?			
RECEIVE ANY FOLLOW-UP TREATMENT?	<input type="checkbox"/> No <input type="checkbox"/> Yes - describe any additional injuries diagnosed: _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes - describe any additional injuries diagnosed: _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Yes - describe any additional injuries diagnosed: _____ <input type="checkbox"/> Unknown
LOST ANY DAYS FROM WORK OR SCHOOL (COLLEGE) DUE TO THE CRASH?	<input type="checkbox"/> No <input type="checkbox"/> Not working prior to crash <input type="checkbox"/> Yes - # of days _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Not working prior to crash <input type="checkbox"/> Yes - # of days _____ <input type="checkbox"/> Unknown	<input type="checkbox"/> No <input type="checkbox"/> Not working prior to crash <input type="checkbox"/> Yes - # of days _____ <input type="checkbox"/> Unknown
IF REQUIRED: WILL YOU SIGN A MEDICAL RELEASE? * If not an in-person interview, make appointment to have release signed	<input type="checkbox"/> No <input type="checkbox"/> Yes* <input type="checkbox"/> Unknown DATE: _____ TIME: _____ PLACE: _____	<input type="checkbox"/> No <input type="checkbox"/> Yes* <input type="checkbox"/> Unknown DATE: _____ TIME: _____ PLACE: _____	<input type="checkbox"/> No <input type="checkbox"/> Yes* <input type="checkbox"/> Unknown DATE: _____ TIME: _____ PLACE: _____

PSU Number 10 Case Number—Stratum 9522 Vehicle Number 01Occupant Number 01**INJURY DATA FROM INTERVIEWEE(S)**Indicate the *Location, Lesion, Detail, and Source* of all injuries. Specify interviewee(s): _____

SOFT TISSUE/INTERNAL INJURIES



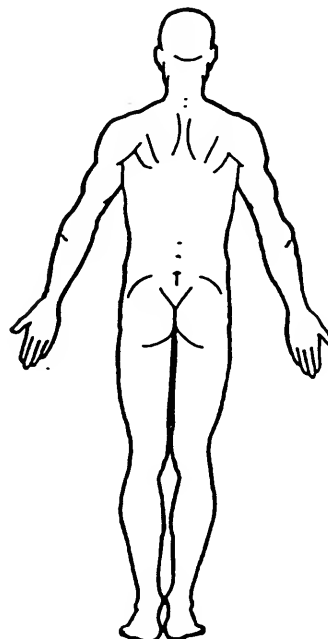
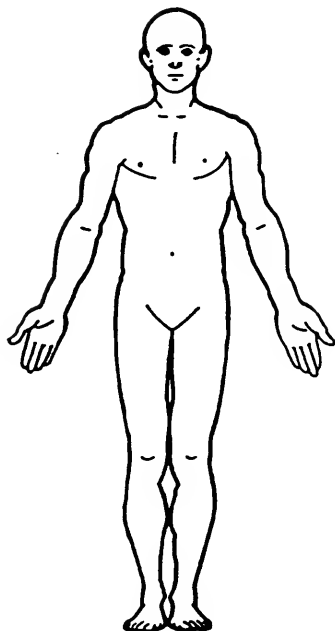
SKELETAL INJURIES



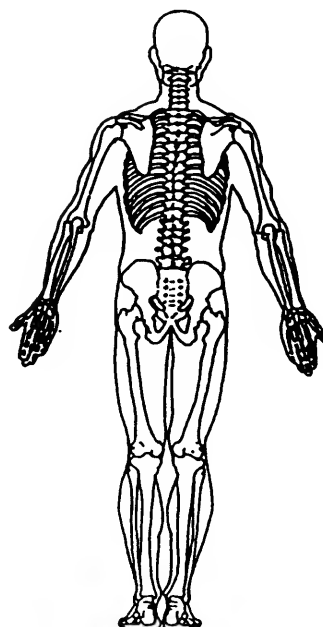
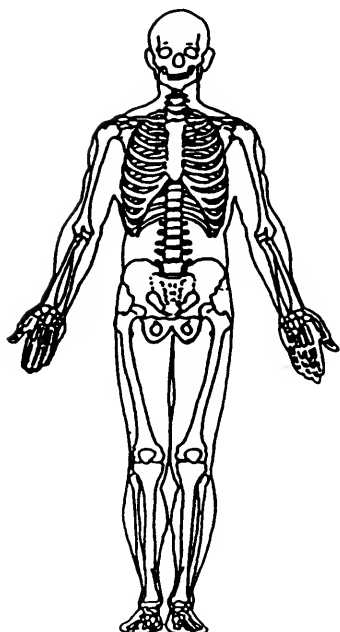
The space provided on the back of this page may be used to further detail injuries noted by the interviewee(s).

PSU Number 10 Case Number—Stratum 9522 Vehicle Number 01 Occupant Number _____**INJURY DATA FROM INTERVIEWEE(S)**Indicate the *Location, Lesion, Detail, and Source* of all injuries. Specify interviewee(s): _____

SOFT TISSUE/INTERNAL INJURIES



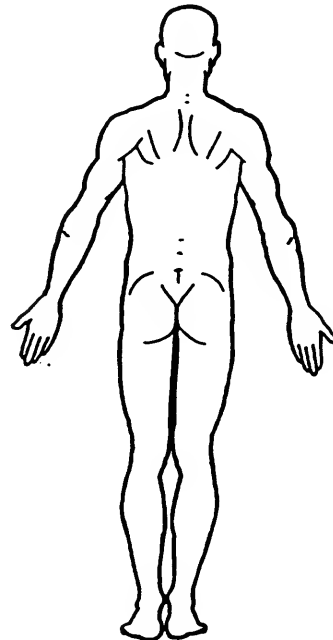
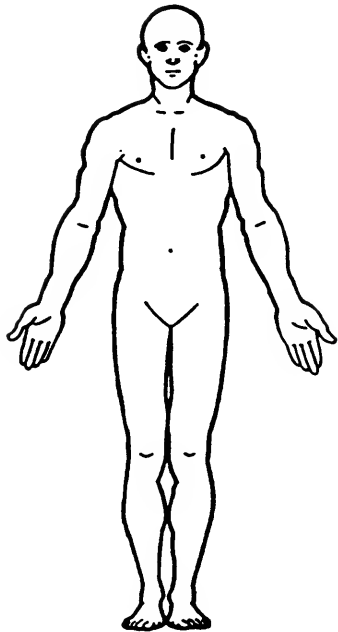
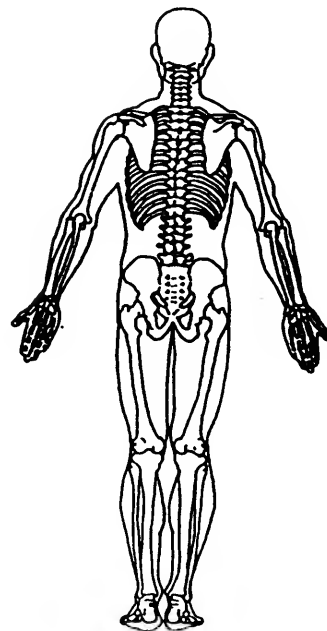
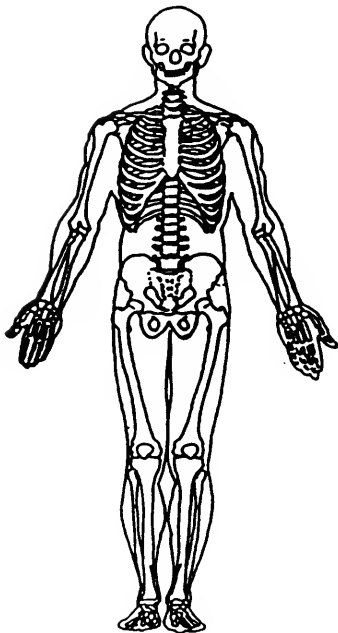
SKELETAL INJURIES



The space provided on the back of this page may be used to further detail injuries noted by the interviewee(s).

PSU Number 10Case Number—Stratum 9522Vehicle Number 01

Occupant Number _____

INJURY DATA FROM INTERVIEWEE(S)Indicate the *Location, Lesion, Detail, and Source* of all injuries. Specify interviewee(s): _____**SOFT TISSUE/INTERNAL INJURIES****SKELETAL INJURIES**

The space provided on the back of this page may be used to further detail injuries noted by the interviewee(s).

NASS CDS OCCUPANT ASSESSMENT FORM:
CASE VEHICLE DRIVER



U.S. Department of Transportation
National Highway Traffic Safety
Administration

OCCUPANT ASSESSMENT FORM

BEST AVAILABLE

Form Approved
O.M.B. No. 2127-0021

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number

10

2. Case Number - Stratum

9522

3. Vehicle Number

01

4. Occupant Number

01

OCCUPANT'S CHARACTERISTICS

5. Occupant's Age

50

Code actual age at time of accident.

(00) Less than one year old (specify by month):

(97) 97 years and older

(99) Unknown

6. Occupant's Sex

2

(1) Male

(2) Female-not reported pregnant

(3) Female-pregnant-1st trimester(1st-3rd month)

(4) Female-pregnant-2nd trimester(4th-6th month)

(5) Female-pregnant-3rd trimester(7th-9th month)

(6) Female-pregnant-term unknown

(9) Unknown

7. Occupant's Height

999

Code actual height to the nearest
centimeter.

(999) Unknown

____ inches X 2.54 = ____ centimeters

8. Occupant's Weight

999

Code actual weight to the nearest
kilogram.

(999) Unknown

____ pounds X .4536 = ____ kilograms

9. Occupant's Role

1

(1) Driver

(2) Passenger

(9) Unknown

OCCUPANT'S SEATING

10. Occupant's Seat Position

11

Front Seat

(11) Left side

(12) Middle

(13) Right side

(14) Other (specify): _____

(15) On or in the lap of another occupant

Second Seat

(21) Left side

(22) Middle

(23) Right side

(24) Other (specify): _____

(25) On or in the lap of another occupant

Third Seat

(31) Left side

(32) Middle

(33) Right side

(34) Other (specify): _____

(35) On or in the lap of another occupant

Fourth Seat

(41) Left side

(42) Middle

(43) Right side

(44) Other (specify): _____

(45) On or in the lap of another occupant

(97) In or on unenclosed area

(98) Other seat (specify): _____

(99) Unknown

11. Occupant's Posture

9

(0) Normal posture

Abnormal posture

(1) Kneeling or standing on seat

(2) Lying on or across seat

(3) Kneeling, standing or sitting in front of seat

(4) Sitting sideways or turned to talk with another
occupant or to look out a rear window

(5) Sitting on a console

(6) Lying back in a reclined seat position

(7) Bracing with feet or hands on a surface in front
of seat

(8) Other abnormal posture (specify): _____

(9) Unknown

EJECTION/ENTRAPMENT12. Ejection 0

- (0) No ejection
- (1) Complete ejection
- (2) Partial ejection
- (3) Ejection, unknown degree
- (9) Unknown

13. Ejection Area 0

- (0) No ejection
- (1) Windshield
- (2) Left front
- (3) Right front
- (4) Left rear
- (5) Right rear
- (6) Rear
- (7) Roof
- (8) Other area (e.g., back of pickup, etc.)
(specify): _____
- (9) Unknown

14. Ejection Medium 0

- (0) No ejection
- (1) Door/hatch/tailgate
- (2) Nonfixed roof structure
- (3) Fixed glazing
- (4) Nonfixed glazing (specify): _____
- (5) Integral structure
- (8) Other medium (specify): _____
- (9) Unknown

15. Medium Status (Immediately Prior To Impact) 0

- (0) No ejection
- (1) Open
- (2) Closed
- (3) Integral structure
- (9) Unknown

16. Entrapment 0

- (0) Not entrapped/exit not inhibited
- (1) Entrapped/pinned - mechanically restrained
- (2) Could not exit vehicle due to jammed doors, fire, etc.
(specify): _____
- (9) Unknown

17. Occupant Mobility 4

- (0) Occupant fatal before removed from vehicle
- (1) Removed from vehicle while unconscious or disoriented
- (2) Removed from vehicle due to injuries
- (3) Exited vehicle with some assistance
- (4) Exited vehicle under own power
- (5) Occupant fully ejected
- (9) Unknown

BELT SYSTEM FUNCTION18. Manual (Active) Belt System Availability 3

- (0) None available
- (1) Belt removed/destroyed
- (2) Shoulder belt
- (3) Lap belt
- (4) Lap and shoulder belt
- (5) Belt available—type unknown

Integral Belt Partially Destroyed

- (6) Shoulder belt (lap belt destroyed/removed)
- (7) Lap belt (shoulder belt destroyed/removed)
- (8) Other belt (specify): _____

(9) Unknown

19. Manual (Active) Belt System Use 9 9

- (00) None used, not available, or belt removed/destroyed
- (01) Inoperative (specify): _____

- (02) Shoulder belt
- (03) Lap belt
- (04) Lap and shoulder belt
- (05) Belt used—type unknown
- (08) Other belt used (specify): _____

- (12) Shoulder belt used with child safety seat
- (13) Lap belt used with child safety seat
- (14) Lap and shoulder belt used with child safety seat
- (15) Belt used with child safety seat—type unknown
- (18) Other belt used with child safety seat (specify): _____
- (99) Unknown if belt used

20. Proper Use of Manual (Active) Belts 9

- (0) None used or not available
- (1) Belt used properly
- (2) Belt used properly with child safety seat

Belt Used Improperly

- (3) Shoulder belt worn under arm
- (4) Shoulder belt worn behind back or seat
- (5) Belt worn around more than one person
- (6) Lap belt worn on abdomen
- (7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify): _____

(8) Other improper use of manual belt system (specify): _____

(9) Unknown

21. Manual (Active) Belt Failure Modes During Accident 9

- (0) No manual belt used or not available
- (1) No manual belt failure(s)
- (2) Torn webbing (stretched webbing not included)
- (3) Broken buckle or latchplate
- (4) Upper anchorage separated
- (5) Other anchorage separated (specify): _____

- (6) Broken retractor
- (7) Combination of above (specify): _____

(8) Other manual belt failure (specify): _____

(9) Unknown

22. Shoulder Belt Upper Anchorage Adjustment 0

- (0) No shoulder belt
- (1) No upper anchorage adjustment for shoulder belt

Adjustable shoulder Belt Upper Anchorage

- (2) In full up position
- (3) In mid position
- (4) In full down position
- (5) Position unknown
- (9) Unknown if position has adjustable upper anchorage adjustment

23. Automatic (Passive) Belt System Availability/Function 0

- (0) Not equipped/not available
- (1) 2 point automatic belts
- (2) 3 point automatic belts
- (3) Automatic belts - type unknown

Non-functional

- (4) Automatic belts destroyed or rendered inoperative
- (9) Unknown

24. Automatic (Passive) Belt System Use 0

- (0) Not equipped/not available/destroyed or rendered inoperative
- (1) Automatic belt in use
- (2) Automatic belt not in use (manually disconnected, motorized track inoperative) (specify): _____
- (3) Automatic belt use unknown
- (9) Unknown

25. Automatic (Passive) Belt System Type 0

- (0) Not equipped/not available
- (1) Non-motorized system
- (2) Motorized system
- (9) Unknown

26. Proper Use of Automatic (Passive) Belt System 0

- (0) Not equipped/not available/not used
- (1) Automatic belt used properly
- (2) Automatic belt used properly with child safety seat

Automatic Belt Used Improperly

- (3) Automatic shoulder belt worn under arm
- (4) Automatic shoulder belt worn behind back
- (5) Automatic belt worn around more than one person
- (6) Lap portion of automatic belt worn on abdomen
- (7) Automatic lap and shoulder belt or automatic shoulder belt used improperly with child safety seat (specify): _____

(8) Other improper use of automatic belt system (specify): _____

(9) Unknown

27. Automatic (Passive) Belt Failure Modes During Accident 0

- (0) Not equipped/not available/not in use
- (1) No automatic belt failure(s)
- (2) Torn webbing (stretched webbing not included)
- (3) Broken buckle or latchplate
- (4) Upper anchorage separated
- (5) Other anchorage separated (specify): _____

(6) Broken retractor

(7) Combination of above (specify): _____

(8) Other automatic belt failure (specify): _____

(9) Unknown

POLICE REPORTED RESTRAINT USE**AIR BAG SYSTEM FUNCTION**28. Police Reported Belt Use 9

- (0) None used
 (1) Police did not indicate belt use
 (2) Shoulder belt
 (3) Lap belt
 (4) Lap and shoulder belt
 (5) Belt used, type not specified
 (6) Child safety seat
 (7) Automatic belt
 (8) Other type belt, (specify):

(9) Police indicated "unknown"

29. Police Reported Air Bag Availability/Function 0

- (0) No air bag available
 (1) Police did not indicate air bag availability/function
 (2) Deployed
 (3) Not deployed
 (4) Unknown if deployed
 (9) Police indicated "unknown"

Check the Primary Source Used In Determining Belt Use.

- [] Not equipped/not available/destroyed or rendered inoperative
 [] Vehicle inspection
 [] Official injury data
 [] Driver/occupant interview
 [] Other (specify):

☒ Unknown if belt used

30. Frontal Air Bag System Availability/Function (This Occupant Position) 0

- (0) Not equipped/not available
 (1) Air bag

Non-functional

(2) Air bag disconnected (specify):

- (3) Air bag not reinstalled
 (9) Unknown

31. Frontal Air Bag System Deployment (This Occupant Position) 0

- (0) Not equipped/not available
 (1) Deployed during accident (as a result of impact)
 (2) Deployed inadvertently just prior to accident
 (3) Deployed, details unknown
 (4) Deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
 (5) Unknown if deployed
 (7) Nondeployed
 (9) Unknown

32. Other Than First Seat Frontal Air Bag Availability/Function (This Occupant Position) 0

- (0) Not equipped/not available
 (1) Air bag

Non-functional

(2) Air bag disconnected (specify):

- (3) Air bag not reinstalled
 (9) Unknown

Specify type of "other" air bag present:

33. Air Bag(s) Deployment, Other Than First Seat Frontal (This Occupant Position) 0

- (0) Not equipped with an "other" air bag
 (1) Deployed during accident (as a result of impact)
 (2) Deployed inadvertently just prior to accident
 (3) Deployed, details unknown
 (4) Deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
 (5) Unknown if deployed
 (7) Nondeployed
 (9) Unknown

34. Are There Indications of Air Bag System Failure? (This Occupant Position) 0

- (0) Not equipped/not available
 (1) No
 (2) Yes (specify):

(9) Unknown

FIRST SEAT FRONTAL AIR BAG SYSTEM EVALUATION

35. Had Vehicle Been in Previous Accident(s)? 0

- (0) Not equipped/not available
(1) No previous accidents

Yes

- (2) Previous accident(s) without deployment(s)
(3) One previous accident with deployment
(4) More than one previous accident with at least one deployment
(8) Previous accidents, unknown deployment status
(9) Unknown

36. Type of Air Bag 0

- (0) Not equipped/not available
(1) Original manufacturer installed system
(2) Retrofitted air bag
(3) Replacement air bag
(8) Unknown type of air bag
(9) Unknown

37. Had Any Prior Maintenance/Service Been Performed On This Air Bag System? 0

- (0) Not equipped/not available
(1) No prior maintenance
(2) Yes, prior maintenance (specify): _____

(9) Unknown

38. Air Bag Deployment Accident Event Sequence Number 0 0

- (00) Not equipped/not available
_____ Code the accident event sequence number that initiated the air bag deployment

- (96) Deployed, unknown event
(97) Not deployed
(98) Unknown if deployed
(99) Unknown

39. CDC For Air Bag Deployment Impact 0

- (0) Not equipped/not available
(1) Highest delta V
(2) Second highest delta V
(3) Other non-coded delta V (specify): _____

- (6) Deployed, unknown event
(7) Not deployed
(8) Unknown if deployed
(9) Unknown

40. Longitudinal Component of +Delta V For Air Bag Deployment Impact - 0 0 0

- (_000) Not equipped/not available
Code the value of the delta V for the impact that initiated the air bag deployment

(_996) Deployment, unknown longitudinal Delta V

(_997) Not deployed

(_998) Unknown if deployed

(_999) Unknown

41. Did Air Bag Module Cover Flap(s) Open At Designated Tear Points? 0

- (0) Not equipped/not available
(1) No
(2) Yes
(3) Deployed, unknown if flap(s) opened at designated tear points
(7) Not deployed
(8) Unknown if deployed
(9) Unknown

42. Were Air Bag Module Cover Flap(s) Damaged? 0

- (0) Not equipped/not available
(1) No
(2) Yes (specify): _____
(3) Deployed, unknown if air bag module cover flap(s) damaged
(7) Not deployed
(8) Unknown if deployed
(9) Unknown

43. Was There Damage To The Air Bag? 0 0

- (00) Not equipped/not available
(01) Not damaged

Yes - Air Bag Damage

- (02) Ruptured
(03) Cut
(04) Torn
(05) Holed
(06) Burned
(07) Abraded
(88) Other damage (specify): _____

- (95) Damaged, details unknown
(96) Deployed, unknown if damaged
(97) Not deployed
(98) Unknown if deployed
(99) Unknown

**FIRST SEAT FRONTAL AIR BAG SYSTEM
EVALUATION** *continued*

44. Source of Air Bag Damage 0 0
 (00) Not equipped/not available
 (01) Not damaged
 (02) Object worn by occupant, (specify): _____
 (03) Object carried by occupant, (specify): _____
 (04) Adaptive/assistive controls, (specify): _____
 (05) Fire in vehicle
 (06) Thermal burns
 (07) Rescue or emergency efforts
 (88) Other damage source (specify): _____
 (95) Damaged, unknown source
 (96) Deployed, unknown if damaged
 (97) Not deployed
 (98) Unknown if deployed
 (99) Unknown
45. Was The Air Bag Tethered? 0
 (0) Not equipped/not available
 (1) No
 (2) Yes (specify number of tether straps): _____
 (3) Deployed, unknown if tethered
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown
46. Did The Air Bag Have Vent Ports? 0
 (0) Not equipped/not available
 (1) No
 (2) Yes (specify number of vent ports): _____
 (3) Deployed, unknown if vent ports present
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown
47. Was the Air Bag in this Occupant's Position Contacted by Another Occupant? 0
 (0) Not equipped/not available
 (1) No
 (2) Yes (specify): _____
 (3) Deployed, unknown if other occupant contact to air bag
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown
48. Was This Occupant Wearing Eye-wear? 0
 (0) Not equipped/not available
 (1) No
 (2) Eyeglasses/sunglasses
 (3) Contact lenses
 (4) Deployed, unknown if eyewear worn
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown

HEAD RESTRAINT AND SEAT EVALUATION

49. Head Restraint Type/Damage by Occupant at This Occupant Position 1
 (0) No head restraints
 (1) Integral—no damage
 (2) Integral—damaged during accident
 (3) Adjustable—no damage
 (4) Adjustable—damaged during accident
 (5) Add-on—no damage
 (6) Add-on—damaged during accident
 (8) Other (specify): _____
 (9) Unknown
50. Seat Type (this Occupant Position) 0 9
 (00) Occupant not seated or no seat
 (01) Bucket
 (02) Bucket with folding back
 (03) Bench
 (04) Bench with separate back cushions
 (05) Bench with folding back(s)
 (06) Split bench with separate back cushions
 (07) Split bench with folding back(s)
 (08) Pedestal (i.e., column supported)
 (09) Box mounted seat (i.e., van type)
 (10) Other seat type (specify): _____
 (99) Unknown
51. Seat Orientation (this Occupant Position) 1
 (0) Occupant not seated or no seat
 (1) Forward facing seat
 (2) Rear facing seat
 (3) Side facing seat (inward)
 (4) Side facing seat (outward)
 (8) Other (specify): _____
 (9) Unknown
52. Seat Track Adjusted Position Prior To Impact 6
 (0) Occupant not seated or no seat
 (1) Non-adjustable seat track
- Adjustable Seat Track**
 (2) Seat at forward most track position
 (3) Seat between forward most and middle track positions
 (4) Seat at middle track position
 (5) Seat between middle and rear most track positions
 (6) Seat at rear most track position
 (9) Unknown

HEAD RESTRAINT AND SEAT EVALUATION *continued***53. Seat Back Incline Prior and Post Impact** 01

- (00) Occupant not seated or no seat
 (01) Not adjustable

Upright prior to impact

- (11) Moved to completely rearward position
 (12) Moved to rearward midrange position
 (13) Moved to slightly rearward position
 (14) Retained pre-impact position
 (15) Moved to slightly forward position
 (16) Moved to forward midrange position
 (17) Moved to completely forward position

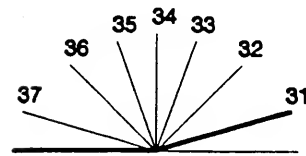
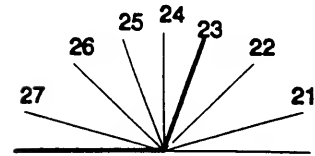
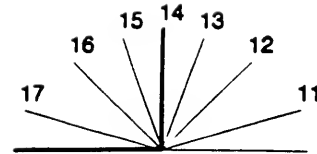
Slightly reclined prior to impact

- (21) Moved to completely rearward position
 (22) Moved to rearward midrange position
 (23) Retained pre-impact position
 (24) Moved to upright position
 (25) Moved to slightly forward position
 (26) Moved to forward midrange position
 (27) Moved to completely forward position

Completely reclined prior to impact

- (31) Retained pre-impact position
 (32) Moved to rearward midrange position
 (33) Moved to slightly rearward position
 (34) Moved to upright position
 (35) Moved to slightly forward position
 (36) Moved to forward midrange position
 (37) Moved to completely forward position

(99) Unknown

**54. Seat Performance (this Occupant Position)** 4

- (0) Occupant not seated or no seat
 (1) No seat performance failure(s)
 (2) Seat adjusters failed
 (3) Seat back folding locks or "seat back" failed (specify): _____
 (4) Seat track/anchors failed
 (5) Deformed by impact of occupant
 (6) Deformed by passenger compartment intrusion, (specify): _____
 (7) Combination of above (specify): _____
 (8) Other (specify): _____
 (9) Unknown

CHILD SAFETY SEAT

55. Child Safety Seat Make/Model ○ ○ ○
 (000) No child safety seat

Applicable codes are found in your NASS CDS
 Data Collection, Coding and Editing

(950) Built-in child safety seat
 (997) Other make/model (specify):

(998) Unknown make/model

(999) Unknown if child safety seat used

56. Type of Child Safety Seat ○

(0) No child safety seat

(1) Infant seat

(2) Toddler seat

(3) Convertible seat

(4) Booster seat - with shield

(5) Booster seat - without shield

(7) Other type child safety seat (specify):

(8) Unknown child safety seat type

(9) Unknown if child safety seat used

57. Child Safety Seat Orientation ○ ○

(00) No child safety seat

Designed for Rear Facing for This Age/Weight

(01) Rear facing

(02) Forward facing

(08) Other orientation (specify):

(09) Unknown orientation

Designed For Forward Facing for This Age/Weight

(11) Rear facing

(12) Forward facing

(18) Other orientation (specify):

(19) Unknown orientation

Unknown Design or Orientation For This Age/Weight, or Unknown Age/Weight

(21) Rear facing

(22) Forward facing

(28) Other orientation (specify):

(29) Unknown orientation

(99) Unknown if child safety seat used

58. Child Safety Seat Harness Usage ○ ○

59. Child Safety Seat Shield Usage ○ ○

60. Child Safety Seat Tether Usage ○ ○

Note: Options below applicable to
 Variables OA58-OA60.

(00) No child safety seat

Not Designed With Harness/Shield/Tether

(01) After market harness/shield/tether
 added, not used

(02) After market harness/shield/tether used

(03) Child safety seat used, but no after market
 harness/shield/tether added

(09) Unknown if harness/shield/tether
 added or used

Designed With Harness/Shield/Tether

(11) Harness/shield/tether not used

(12) Harness/shield/tether used

(19) Unknown if harness/shield/tether used

Unknown If Designed With Harness/Shield/Tether

(21) Harness/shield/tether not used

(22) Harness/shield/tether used

(29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

INJURY CONSEQUENCES61. Injury Severity (Police Rating) 0

- (0) O - No injury
- (1) C - Possible injury
- (2) B - Nonincapacitating injury
- (3) A - Incapacitating injury
- (4) K - Killed
- (5) U - Injury, severity unknown
- (6) Died prior to accident
- (9) Unknown

62. Treatment - Mortality 4

- (0) No treatment
- (1) Fatal
- (2) Fatal - ruled disease (specify):

Nonfatal

- (3) Hospitalization
- (4) Transported and released
- (5) Treatment at scene - nontransported
- (6) Treatment later
- (7) Treatment - other (specify):

- (8) Transported to a medical facility-unknown if treated
- (9) Unknown

63. Type Of Medical Facility (for Initial Treatment) 2

- (0) Not treated at a medical facility
- (1) Trauma center
- (2) Hospital
- (3) Medical clinic
- (4) Physician's office
- (5) Treatment later at medical facility
- (8) Other (specify):

(9) Unknown

64. Hospital Stay 00

- (00) Not Hospitalized
- Code the number of days (up through 60) that the occupant stayed in hospital.
- (61) 61 days or more
- (99) Unknown

65. Working Days Lost 99

- Code the number of days (up through 60) that the occupant lost from work due to the accident
- (00) No working days lost
- (61) 61 days or more
- (62) Fatally injured
- (97) Not working prior to accident
- (99) Unknown

STOP WORK HERE**VARIABLES 66-74****TO BE CODED BY THE ZONE CENTER**

TO BE CODED BY THE ZONE CENTER**INJURY CONSEQUENCES**

66. Time to Death 0 0
 Code number of hours from time of accident to time of death up through 24 hours. If time of death is greater than 24 hours, code number of days. (Note: 1 day = 31, 2 days = 32, ... n days = 30 + n up through 30 days = 60)
 (00) Not fatal
 (96) Fatal - ruled disease
 (99) Unknown
67. 1st Medically Reported Cause of Death 0 0
68. 2nd Medically Reported Cause of Death 0 0
69. 3rd Medically Reported Cause of Death 0 0
 Code the Occupant Injury from line number(s) for the medically reported injury(s) which reportedly contributed to this occupant's death
 (00) Not fatal or no additional causes
 (96) Mode of death given but specific injuries are not linked to cause of death. (specify):
 (97) Other result (includes fatal ruled disease) (specify):
 (99) Unknown
70. Number of Recorded Injuries for This Occupant 0 0
 Code the actual number of injuries recorded for this occupant.
 (00) No recorded injuries
 (97) Injured, details unknown
 (99) Unknown if injured

TRAUMA DATA

71. Glasgow Coma Scale (GCS) Score 0 0
 (at Medical Facility)
 (00) Not injured
 (01) Injured - not treated at medical facility
 (02) No GCS Score at medical facility
 (03-15) Code the actual value of the initial GCS Score recorded at medical facility.
 (97) Injured, details unknown
 (99) Unknown if injured
72. Was the Occupant Given Blood? 0
 (1) No - blood not given
 (2) Yes - blood given
 (specify units):
 (9) Unknown if blood given
73. Arterial Blood Gases (ABG) - HCO₃ 0 0
 (00) Not injured
 (01) Injured, ABGs not measured or reported
 (02-50) Code the actual value of the HCO₃
 (96) ABGs reported, HCO₃ unknown
 (97) Injured, details unknown
 (99) Unknown if injured

BELT USE DETERMINATION

74. Primary Source of Belt Use Determination 9
 (0) Not equipped/not available/destroyed or rendered inoperative
 (1) Vehicle inspection
 (2) Official injury data
 (3) Driver/occupant interview
 (8) Other (specify):
 (9) Unknown if belt used

NASS CDS OCCUPANT ASSESSMENT FORM:
PEDESTRIAN



U.S. Department of Transportation
National Highway Traffic Safety
Administration

OCCUPANT ASSESSMENT FORM

Form Approved
O.M.B. No. 2127-0021

NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number 10

2. Case Number - Stratum 9522

3. Vehicle Number X

4. Occupant Number (*Pedestrian*) 01

OCCUPANT'S CHARACTERISTICS

5. Occupant's Age 05

Code actual age at time of accident.

(00) Less than one year old (specify by month):

(97) 97 years and older

(99) Unknown

6. Occupant's Sex 2

(1) Male

(2) Female-not reported pregnant

(3) Female-pregnant-1st trimester(1st-3rd month)

(4) Female-pregnant-2nd trimester(4th-6th month)

(5) Female-pregnant-3rd trimester(7th-9th month)

(6) Female-pregnant-term unknown

(9) Unknown

7. Occupant's Height 116

Code actual height to the nearest
centimeter.

(999) Unknown

45.5 inches X 2.54 = 116 centimeters

8. Occupant's Weight 017

Code actual weight to the nearest
kilogram.

(999) Unknown

37.5 pounds X .4536 = 17 kilograms

9. Occupant's Role X

(1) Driver

(2) Passenger

(9) Unknown

OCCUPANT'S SEATING

10. Occupant's Seat Position X

Front Seat

(11) Left side

(12) Middle

(13) Right side

(14) Other (specify):

(15) On or in the lap of another occupant

Second Seat

(21) Left side

(22) Middle

(23) Right side

(24) Other (specify):

(25) On or in the lap of another occupant

Third Seat

(31) Left side

(32) Middle

(33) Right side

(34) Other (specify):

(35) On or in the lap of another occupant

Fourth Seat

(41) Left side

(42) Middle

(43) Right side

(44) Other (specify):

(45) On or in the lap of another occupant

(97) In or on unenclosed area

(98) Other seat (specify):

(99) Unknown

11. Occupant's Posture X

(0) Normal posture

Abnormal posture

(1) Kneeling or standing on seat

(2) Lying on or across seat

(3) Kneeling, standing or sitting in front of seat

(4) Sitting sideways or turned to talk with another
occupant or to look out a rear window

(5) Sitting on a console

(6) Lying back in a reclined seat position

(7) Bracing with feet or hands on a surface in front
of seat

(8) Other abnormal posture (specify):

(9) Unknown

EJECTION/ENTRAPMENT12. Ejection ☒

- (0) No ejection
- (1) Complete ejection
- (2) Partial ejection
- (3) Ejection, unknown degree
- (9) Unknown

13. Ejection Area ☒

- (0) No ejection
- (1) Windshield
- (2) Left front
- (3) Right front
- (4) Left rear
- (5) Right rear
- (6) Rear
- (7) Roof
- (8) Other area (e.g., back of pickup, etc.)
(specify): _____
- (9) Unknown

14. Ejection Medium ☒

- (0) No ejection
- (1) Door/hatch/tailgate
- (2) Nonfixed roof structure
- (3) Fixed glazing
- (4) Nonfixed glazing (specify): _____

- (5) Integral structure
- (8) Other medium (specify): _____

- (9) Unknown

15. Medium Status (Immediately Prior To Impact) ☒

- (0) No ejection
- (1) Open
- (2) Closed
- (3) Integral structure
- (9) Unknown

16. Entrapment ☒

- (0) Not entrapped/exit not inhibited
- (1) Entrapped/pinned - mechanically restrained
- (2) Could not exit vehicle due to jammed doors, fire, etc.
(specify): _____
- (9) Unknown

17. Occupant Mobility ☒

- (0) Occupant fatal before removed from vehicle
- (1) Removed from vehicle while unconscious or disoriented
- (2) Removed from vehicle due to injuries
- (3) Exited vehicle with some assistance
- (4) Exited vehicle under own power
- (5) Occupant fully ejected
- (9) Unknown

BELT SYSTEM FUNCTION18. Manual (Active) Belt System Availability ☒

- (0) None available
- (1) Belt removed/destroyed
- (2) Shoulder belt
- (3) Lap belt
- (4) Lap and shoulder belt
- (5) Belt available—type unknown

Integral Belt Partially Destroyed

- (6) Shoulder belt (lap belt destroyed/removed)
- (7) Lap belt (shoulder belt destroyed/removed)
- (8) Other belt (specify):

(9) Unknown ☒19. Manual (Active) Belt System Use ☒

- (00) None used, not available, or belt removed/destroyed
- (01) Inoperative (specify):

- (02) Shoulder belt
- (03) Lap belt
- (04) Lap and shoulder belt
- (05) Belt used—type unknown
- (08) Other belt used (specify):

- (12) Shoulder belt used with child safety seat
- (13) Lap belt used with child safety seat
- (14) Lap and shoulder belt used with child safety seat
- (15) Belt used with child safety seat—type unknown
- (18) Other belt used with child safety seat (specify):
- (99) Unknown if belt used

20. Proper Use of Manual (Active) Belts ☒

- (0) None used or not available
- (1) Belt used properly
- (2) Belt used properly with child safety seat

Belt Used Improperly

- (3) Shoulder belt worn under arm
- (4) Shoulder belt worn behind back or seat
- (5) Belt worn around more than one person
- (6) Lap belt worn on abdomen
- (7) Lap belt or lap and shoulder belt used improperly with child safety seat (specify):

(8) Other improper use of manual belt system (specify):

(9) Unknown ☒21. Manual (Active) Belt Failure Modes During Accident ☒

- (0) No manual belt used or not available
- (1) No manual belt failure(s)
- (2) Torn webbing (stretched webbing not included)
- (3) Broken buckle or latchplate
- (4) Upper anchorage separated
- (5) Other anchorage separated (specify):

(6) Broken retractor

(7) Combination of above (specify):

(8) Other manual belt failure (specify):

(9) Unknown ☒22. Shoulder Belt Upper Anchorage Adjustment ☒

- (0) No shoulder belt
- (1) No upper anchorage adjustment for shoulder belt

Adjustable shoulder Belt Upper Anchorage

- (2) In full up position
- (3) In mid position
- (4) In full down position
- (5) Position unknown
- (9) Unknown if position has adjustable upper anchorage adjustment

23. Automatic (Passive) Belt System Availability/Function ☒

- (0) Not equipped/not available
- (1) 2 point automatic belts
- (2) 3 point automatic belts
- (3) Automatic belts - type unknown

Non-functional

- (4) Automatic belts destroyed or rendered inoperative
- (9) Unknown

24. Automatic (Passive) Belt System Use ☒

- (0) Not equipped/not available/destroyed or rendered inoperative
- (1) Automatic belt in use
- (2) Automatic belt not in use (manually disconnected, motorized track inoperative) (specify):
- (3) Automatic belt use unknown
- (9) Unknown

25. Automatic (Passive) Belt System Type ☒

- (0) Not equipped/not available
- (1) Non-motorized system
- (2) Motorized system
- (9) Unknown

26. Proper Use of Automatic (Passive) Belt System ☒

- (0) Not equipped/not available/not used
- (1) Automatic belt used properly
- (2) Automatic belt used properly with child safety seat

Automatic Belt Used Improperly

- (3) Automatic shoulder belt worn under arm
- (4) Automatic shoulder belt worn behind back
- (5) Automatic belt worn around more than one person
- (6) Lap portion of automatic belt worn on abdomen
- (7) Automatic lap and shoulder belt or automatic shoulder belt used improperly with child safety seat (specify):

(8) Other improper use of automatic belt system (specify):

(9) Unknown ☒27. Automatic (Passive) Belt Failure Modes During Accident ☒

- (0) Not equipped/not available/not in use
- (1) No automatic belt failure(s)
- (2) Torn webbing (stretched webbing not included)
- (3) Broken buckle or latchplate
- (4) Upper anchorage separated
- (5) Other anchorage separated (specify):

(6) Broken retractor

(7) Combination of above (specify):

(8) Other automatic belt failure (specify):

(9) Unknown ☒

POLICE REPORTED RESTRAINT USE

28. Police Reported Belt Use X

- (0) None used
 (1) Police did not indicate belt use
 (2) Shoulder belt
 (3) Lap belt
 (4) Lap and shoulder belt
 (5) Belt used, type not specified
 (6) Child safety seat
 (7) Automatic belt
 (8) Other type belt, (specify):

(9) Police indicated "unknown"

29. Police Reported Air Bag Availability/Function X

- (0) No air bag available
 (1) Police did not indicate air bag availability/function
 (2) Deployed
 (3) Not deployed
 (4) Unknown if deployed
 (9) Police indicated "unknown"

Check the Primary Source Used In Determining Belt Use.

- [] Not equipped/not available/destroyed or rendered inoperative
 [] Vehicle inspection
 [] Official injury data
 [] Driver/occupant interview
 [] Other (specify):
 [] Unknown if belt used

AIR BAG SYSTEM FUNCTION

30. Frontal Air Bag System Availability/Function (This Occupant Position) X

- (0) Not equipped/not available
 (1) Air bag

Non-functional

- (2) Air bag disconnected (specify):

- (3) Air bag not reinstalled
 (9) Unknown

31. Frontal Air Bag System Deployment (This Occupant Position) X

- (0) Not equipped/not available
 (1) Deployed during accident (as a result of impact)
 (2) Deployed inadvertently just prior to accident
 (3) Deployed, details unknown
 (4) Deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
 (5) Unknown if deployed
 (7) Nondeployed
 (9) Unknown

32. Other Than First Seat Frontal Air Bag Availability/Function (This Occupant Position) X

- (0) Not equipped/not available
 (1) Air bag

Non-functional

- (2) Air bag disconnected (specify):

- (3) Air bag not reinstalled
 (9) Unknown

Specify type of "other" air bag present:

33. Air Bag(s) Deployment, Other Than First Seat Frontal (This Occupant Position) X

- (0) Not equipped with an "other" air bag
 (1) Deployed during accident (as a result of impact)
 (2) Deployed inadvertently just prior to accident
 (3) Deployed, details unknown
 (4) Deployed as a result of a noncollision event during accident sequence (e.g., fire, explosion, electrical)
 (5) Unknown if deployed
 (7) Nondeployed
 (9) Unknown

34. Are There Indications of Air Bag System Failure? (This Occupant Position) X

- (0) Not equipped/not available
 (1) No
 (2) Yes (specify):

(9) Unknown

FIRST SEAT FRONTAL AIR BAG SYSTEM EVALUATION

35. Had Vehicle Been in Previous Accident(s)? ☒

- (0) Not equipped/not available
(1) No previous accidents

Yes

- (2) Previous accident(s) without deployment(s)
(3) One previous accident with deployment
(4) More than one previous accident with at least one deployment
(8) Previous accidents, unknown deployment status
(9) Unknown

36. Type of Air Bag ☒

- (0) Not equipped/not available
(1) Original manufacturer installed system
(2) Retrofitted air bag
(3) Replacement air bag
(8) Unknown type of air bag
(9) Unknown

37. Had Any Prior Maintenance/Service Been Performed On This Air Bag System? ☒

- (0) Not equipped/not available
(1) No prior maintenance
(2) Yes, prior maintenance (specify): _____

(9) Unknown

38. Air Bag Deployment Accident Event Sequence Number ☒

- (00) Not equipped/not available
_____ Code the accident event sequence number that initiated the air bag deployment

- (96) Deployed, unknown event
(97) Not deployed
(98) Unknown if deployed
(99) Unknown

39. CDC For Air Bag Deployment Impact ☒

- (0) Not equipped/not available
(1) Highest delta V
(2) Second highest delta V
(3) Other non-coded delta V (specify): _____

- (6) Deployed, unknown event
(7) Not deployed
(8) Unknown if deployed
(9) Unknown

40. Longitudinal Component of Delta V For Air Bag Deployment Impact ☒

(_ 000) Not equipped/not available
Code the value of the delta V for the impact that initiated the air bag deployment

- (_ 996) Deployment, unknown longitudinal Delta V
(_ 997) Not deployed
(_ 998) Unknown if deployed
(_ 999) Unknown

41. Did Air Bag Module Cover Flap(s) Open At Designated Tear Points? ☒

- (0) Not equipped/not available
(1) No
(2) Yes
(3) Deployed, unknown if flap(s) opened at designated tear points
(7) Not deployed
(8) Unknown if deployed
(9) Unknown

42. Were Air Bag Module Cover Flap(s) Damaged? ☒

- (0) Not equipped/not available
(1) No
(2) Yes (specify): _____
(3) Deployed, unknown if air bag module cover flap(s) damaged
(7) Not deployed
(8) Unknown if deployed
(9) Unknown

43. Was There Damage To The Air Bag? ☒

- (00) Not equipped/not available
(01) Not damaged

Yes - Air Bag Damage

- (02) Ruptured
(03) Cut
(04) Torn
(05) Holed
(06) Burned
(07) Abraded
(88) Other damage (specify): _____

- (95) Damaged, details unknown
(96) Deployed, unknown if damaged
(97) Not deployed
(98) Unknown if deployed
(99) Unknown

**FIRST SEAT FRONTAL AIR BAG SYSTEM
EVALUATION** *continued*

44. Source of Air Bag Damage ☒
 (00) Not equipped/not available
 (01) Not damaged
 (02) Object worn by occupant, (specify): _____
 (03) Object carried by occupant, (specify): _____
 (04) Adaptive/assistive controls, (specify): _____
 (05) Fire in vehicle
 (06) Thermal burns
 (07) Rescue or emergency efforts
 (08) Other damage source (specify): _____
 (95) Damaged, unknown source
 (96) Deployed, unknown if damaged
 (97) Not deployed
 (98) Unknown if deployed
 (99) Unknown
45. Was The Air Bag Tethered? ☒
 (0) Not equipped/not available
 (1) No
 (2) Yes (specify number of tether straps): _____
 (3) Deployed, unknown if tethered
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown
46. Did The Air Bag Have Vent Ports? ☒
 (0) Not equipped/not available
 (1) No
 (2) Yes (specify number of vent ports): _____
 (3) Deployed, unknown if vent ports present
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown
47. Was the Air Bag in this Occupant's Position Contacted by Another Occupant? ☒
 (0) Not equipped/not available
 (1) No
 (2) Yes (specify): _____
 (3) Deployed, unknown if other occupant contact to air bag
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown
48. Was This Occupant Wearing Eye-wear? ☒
 (0) Not equipped/not available
 (1) No
 (2) Eyeglasses/sunglasses
 (3) Contact lenses
 (4) Deployed, unknown if eyewear worn
 (7) Not deployed
 (8) Unknown if deployed
 (9) Unknown

HEAD RESTRAINT AND SEAT EVALUATION

49. Head Restraint Type/Damage by Occupant at This Occupant Position ☒
 (0) No head restraints
 (1) Integral—no damage
 (2) Integral—damaged during accident
 (3) Adjustable—no damage
 (4) Adjustable—damaged during accident
 (5) Add-on—no damage
 (6) Add-on—damaged during accident
 (8) Other (specify): _____
 (9) Unknown
50. Seat Type (this Occupant Position) ☒
 (00) Occupant not seated or no seat
 (01) Bucket
 (02) Bucket with folding back
 (03) Bench
 (04) Bench with separate back cushions
 (05) Bench with folding back(s)
 (06) Split bench with separate back cushions
 (07) Split bench with folding back(s)
 (08) Pedestal (i.e., column supported)
 (09) Box mounted seat (i.e., van type)
 (10) Other seat type (specify): _____
 (99) Unknown
51. Seat Orientation (this Occupant Position) ☒
 (0) Occupant not seated or no seat
 (1) Forward facing seat
 (2) Rear facing seat
 (3) Side facing seat (inward)
 (4) Side facing seat (outward)
 (8) Other (specify): _____
 (9) Unknown
52. Seat Track Adjusted Position Prior To Impact ☒
 (0) Occupant not seated or no seat
 (1) Non-adjustable seat track
- Adjustable Seat Track*
 (2) Seat at forward most track position
 (3) Seat between forward most and middle track positions
 (4) Seat at middle track position
 (5) Seat between middle and rear most track positions
 (6) Seat at rear most track position
 (9) Unknown

HEAD RESTRAINT AND SEAT EVALUATION *continued***53. Seat Back Incline Prior and Post Impact**

(00) Occupant not seated or no seat

(01) Not adjustable

Upright prior to impact

(11) Moved to completely rearward position

(12) Moved to rearward midrange position

(13) Moved to slightly rearward position

(14) Retained pre-impact position

(15) Moved to slightly forward position

(16) Moved to forward midrange position

(17) Moved to completely forward position

Slightly reclined prior to impact

(21) Moved to completely rearward position

(22) Moved to rearward midrange position

(23) Retained pre-impact position

(24) Moved to upright position

(25) Moved to slightly forward position

(26) Moved to forward midrange position

(27) Moved to completely forward position

Completely reclined prior to impact

(31) Retained pre-impact position

(32) Moved to rearward midrange position

(33) Moved to slightly rearward position

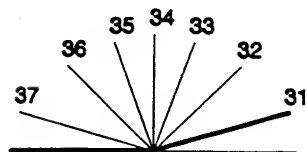
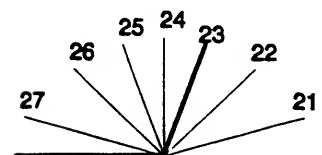
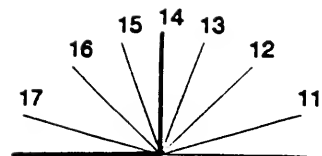
(34) Moved to upright position

(35) Moved to slightly forward position

(36) Moved to forward midrange position

(37) Moved to completely forward position

(99) Unknown

**54. Seat Performance (this Occupant Position)**

(0) Occupant not seated or no seat

(1) No seat performance failure(s)

(2) Seat adjusters failed

(3) Seat back folding locks or "seat back" failed (specify): _____

(4) Seat track/anchors failed

(5) Deformed by impact of occupant

(6) Deformed by passenger compartment intrusion, (specify): _____

(7) Combination of above (specify): _____

(8) Other (specify): _____

(9) Unknown

CHILD SAFETY SEAT

55. Child Safety Seat Make/Model

(000) No child safety seat

Applicable codes are found in your NASS CDS
Data Collection, Coding and Editing

(950) Built-in child safety seat

(997) Other make/model (specify):

(998) Unknown make/model

(999) Unknown if child safety seat used

56. Type of Child Safety Seat

(0) No child safety seat

(1) Infant seat

(2) Toddler seat

(3) Convertible seat

(4) Booster seat - with shield

(5) Booster seat - without shield

(7) Other type child safety seat (specify):

(8) Unknown child safety seat type

(9) Unknown if child safety seat used

57. Child Safety Seat Orientation

(00) No child safety seat

Designed for Rear Facing for This Age/Weight

(01) Rear facing

(02) Forward facing

(08) Other orientation (specify):

(09) Unknown orientation

Designed For Forward Facing for This Age/Weight

(11) Rear facing

(12) Forward facing

(18) Other orientation (specify):

(19) Unknown orientation

*Unknown Design or Orientation For This
Age/Weight, or Unknown Age/Weight*

(21) Rear facing

(22) Forward facing

(28) Other orientation (specify):

(29) Unknown orientation

(99) Unknown if child safety seat used

58. Child Safety Seat Harness Usage

59. Child Safety Seat Shield Usage

60. Child Safety Seat Tether Usage

Note: Options below applicable to
Variables OA58-OA60.

(00) No child safety seat

Not Designed With Harness/Shield/Tether(01) After market harness/shield/tether
added, not used

(02) After market harness/shield/tether used

(03) Child safety seat used, but no after market
harness/shield/tether added(09) Unknown if harness/shield/tether
added or used*Designed With Harness/Shield/Tether*

(11) Harness/shield/tether not used

(12) Harness/shield/tether used

(19) Unknown if harness/shield/tether used

Unknown If Designed With Harness/Shield/Tether

(21) Harness/shield/tether not used

(22) Harness/shield/tether used

(29) Unknown if harness/shield/tether used

(99) Unknown if child safety seat used

INJURY CONSEQUENCES61. Injury Severity (Police Rating) 4

- (0) O - No injury
- (1) C - Possible injury
- (2) B - Nonincapacitating injury
- (3) A - Incapacitating injury
- (4) K - Killed
- (5) U - Injury, severity unknown
- (6) Died prior to accident
- (9) Unknown

62. Treatment - Mortality 1

- (0) No treatment
- (1) Fatal
- (2) Fatal - ruled disease (specify):

Nonfatal

- (3) Hospitalization
- (4) Transported and released
- (5) Treatment at scene - nontransported
- (6) Treatment later
- (7) Treatment - other (specify):

- (8) Transported to a medical facility-unknown if treated
- (9) Unknown

63. Type Of Medical Facility (for Initial Treatment) 9

- (0) Not treated at a medical facility
- (1) Trauma center
- (2) Hospital
- (3) Medical clinic
- (4) Physician's office
- (5) Treatment later at medical facility
- (8) Other (specify):

(9) Unknown

64. Hospital Stay 00

- (00) Not Hospitalized
_____ Code the number of days (up through 60)
that the occupant stayed in hospital.
- (61) 61 days or more
- (99) Unknown

65. Working Days Lost 97

- _____ Code the number of days
(up through 60) that the occupant
lost from work due to the accident
- (00) No working days lost
- (61) 61 days or more
- (62) Fatally injured
- (97) Not working prior to accident
- (99) Unknown

STOP WORK HERE**VARIABLES 66-74****TO BE CODED BY THE ZONE CENTER**

TO BE CODED BY THE ZONE CENTER**INJURY CONSEQUENCES****TRAUMA DATA**

66. Time to Death 01
 _____ Code number of hours from time of accident to time of death up through 24 hours. If time of death is greater than 24 hours, code number of days. (Note: 1 day = 31, 2 days = 32, ... n days = 30 + n up through 30 days = 60) *1 hour + 3 minutes*
 (00) Not fatal
 (96) Fatal - ruled disease
 (99) Unknown

67. 1st Medically Reported Cause of Death 06

68. 2nd Medically Reported Cause of Death 07

69. 3rd Medically Reported Cause of Death 00
 _____ Code the Occupant Injury from line number(s) for the medically reported injury(s) which reportedly contributed to this occupant's death
 (00) Not fatal or no additional causes
 (96) Mode of death given but specific injuries are not linked to cause of death. (specify):

(97) Other result (includes fatal ruled disease) (specify):

(99) Unknown

70. Number of Recorded Injuries for This Occupant 16
 _____ Code the actual number of injuries recorded for this occupant.
 (00) No recorded injuries
 (97) Injured, details unknown
 (99) Unknown if injured

71. Glasgow Coma Scale (GCS) Score 02
 (at Medical Facility)
 (00) Not injured
 (01) Injured - not treated at medical facility
 (02) No GCS Score at medical facility
 (03-15) Code the actual value of the initial GCS Score recorded at medical facility.
 (97) Injured, details unknown
 (99) Unknown if injured

72. Was the Occupant Given Blood? 9
 (1) No - blood not given
 (2) Yes - blood given
 (specify units):
 (9) Unknown if blood given

73. Arterial Blood Gases (ABG) - HCO₃ 01
 (00) Not injured
 (01) Injured, ABGs not measured or reported
 (02-50) Code the actual value of the HCO₃
 (96) ABGs reported, HCO₃ unknown
 (97) Injured, details unknown
 (99) Unknown if injured

BELT USE DETERMINATION

74. Primary Source of Belt Use Determination X
 (0) Not equipped/not available/destroyed or rendered inoperative
 (1) Vehicle inspection
 (2) Official injury data
 (3) Driver/occupant interview
 (8) Other (specify):
 (9) Unknown if belt used

NASS CDS OCCUPANT INJURY FORM:
PEDESTRIAN



U.S. Department of Transportation
National Highway Traffic Safety
Administration

OCCUPANT INJURY FORM

BEST AVAILABLE
Form Approved
O.M.B. No. 2127-0021
NATIONAL ACCIDENT SAMPLING SYSTEM
CRASHWORTHINESS DATA SYSTEM

1. Primary Sampling Unit Number <u>10</u>	3. ^{Pedestrian} Vehicle Number <u>01</u>
2. Case Number - Stratum <u>9522</u>	4. Occupant Number <u> </u>

INJURY DATA

Record below the actual injuries sustained by this occupant that were identified from the official and unofficial data sources. Remember not to double count an injury just because it was identified from two different sources. If greater than ten injuries have been documented, encode the balance on the Occupant Injury Supplement.

Source of Injury Data	Body Region	A.I.S. - 90				Injury Source	Injury Confidence Level	Direct/Indirect Injury	Occupant Area Intrusion Number		
		Type of Anatomic Structure	Specific Anatomic Structure	Level of Injury	A.I.S. Severity					Aspect	
Laceration [®] cerebral/1st hemisphere	5. <u>1</u>	6. <u>1</u>	7. <u>4</u>	8. <u>06</u>	9. <u>88</u>	10. <u>4</u>	11. <u>1</u>	12. <u>512</u>	13. <u>1</u>	14. <u>1</u>	15. <u>00</u>
Cerebral Contusions ^{2nd}	16. <u>1</u>	17. <u>1</u>	18. <u>4</u>	19. <u>06</u>	20. <u>12</u>	21. <u>3</u>	22. <u>9</u>	23. <u>512</u>	24. <u>1</u>	25. <u>1</u>	26. <u>00</u>
Contusions bilateral ^{3rd} Lungs	27. <u>1</u>	28. <u>4</u>	29. <u>4</u>	30. <u>14</u>	31. <u>10</u>	32. <u>4</u>	33. <u>3</u>	34. <u>512</u>	35. <u>1</u>	36. <u>1</u>	37. <u>00</u>
Lacerations [®] Liver ^{4th}	38. <u>1</u>	39. <u>5</u>	40. <u>4</u>	41. <u>18</u>	42. <u>24</u>	43. <u>3</u>	44. <u>1</u>	45. <u>512</u>	46. <u>1</u>	47. <u>1</u>	48. <u>00</u>
Transection Urinary ^{5th} Bladder	49. <u>1</u>	50. <u>5</u>	51. <u>4</u>	52. <u>06</u>	53. <u>24</u>	54. <u>4</u>	55. <u>8</u>	56. <u>512</u>	57. <u>1</u>	58. <u>1</u>	59. <u>00</u>
Basilar skull Frx with ^{6th} comminution	60. <u>1</u>	61. <u>1</u>	62. <u>5</u>	63. <u>02</u>	64. <u>06</u>	65. <u>4</u>	66. <u>8</u>	67. <u>512</u>	68. <u>1</u>	69. <u>1</u>	70. <u>00</u>
Fracture, gaping [®] skull ^{7th}	71. <u>1</u>	72. <u>1</u>	73. <u>5</u>	74. <u>04</u>	75. <u>04</u>	76. <u>3</u>	77. <u>1</u>	78. <u>512</u>	79. <u>1</u>	80. <u>1</u>	81. <u>00</u>
Fracture skull ^{8th}	82. <u>1</u>	83. <u>1</u>	84. <u>5</u>	85. <u>04</u>	86. <u>02</u>	87. <u>2</u>	88. <u>2</u>	89. <u>512</u>	90. <u>1</u>	91. <u>1</u>	92. <u>00</u>
Laceration [®] ear ^{9th}	93. <u>1</u>	94. <u>2</u>	95. <u>9</u>	96. <u>06</u>	97. <u>02</u>	98. <u>1</u>	99. <u>1</u>	100. <u>512</u>	101. <u>1</u>	102. <u>1</u>	103. <u>00</u>
Laceration [®] scalp ^{10th}	104. <u>1</u>	105. <u>2</u>	106. <u>9</u>	107. <u>06</u>	108. <u>02</u>	109. <u>1</u>	110. <u>1</u>	111. <u>512</u>	112. <u>1</u>	113. <u>1</u>	114. <u>00</u>

OCCUPANT INJURY DATA

[illegible]

OCCUPANT INJURY CLASSIFICATION

Body Region	Specific Anatomic Structure	Level of Injury	Aspect
(1) Head		Specific injuries are assigned consecutive two-digit numbers beginning with 02.	(1) Right
(2) Face			(2) Left
(3) Neck	<u>Vessels, Nerves, Organs.</u>		(3) Bilateral
(4) Thorax	<u>Bones, Joints</u> are assigned consecutive two digit numbers beginning with 02.		(4) Central
(5) Abdomen		To the extent possible, within the organizational framework of the AIS, 00 is assigned to an injury NFS as to severity or where only one injury is given in the dictionary for that anatomic structure. 99 is assigned to any injury NFS as to lesion or severity.	(5) Anterior
(6) Spine			(6) Posterior
(7) Upper Extremity			(7) Superior
(8) Lower Extremity			(8) Inferior
(9) Unspecified	The exceptions to this rule apply to:		(9) Unknown
			(0) Whole region
Type of Anatomic Structure	<u>Whole Area</u>		
(1) Whole Area	(02) Skin - Abrasion		
(2) Vessels	(04) Skin - Contusion		
(3) Nerves	(06) Skin - Laceration		
(4) Organs (includes Muscles/ligaments)	(08) Skin - Avulsion		
(5) Skeletal (includes joints)	(10) Amputation		
(6) Head - LOC	(20) Burn		
(9) Skin	(30) Crush		
	(40) Degloving		
	(50) Injury - NFS		
	(90) Trauma, other than mechanical		
	<u>Head - LOC</u>		
	(02) Length of LOC		
	(04) Level		
	(06) of		
	(08) Consciousness		
	(10) Concussion		
	<u>Spine</u>		
	(02) Cervical		
	(04) Thoracic		
	(06) Lumbar		

Abbreviated Injury Scale

- (1) Minor Injury
- (2) Moderate Injury
- (3) Serious Injury
- (4) Severe Injury
- (5) Critical Injury
- (6) Maximum (untreatable)
- (7) Injured, unknown severity

SOURCE OF INJURY DATA**INJURY SOURCE****DIRECT/INDIRECT INJURY****CONFIDENCE LEVEL**OFFICIAL RECORDS

- (1) Autopsy records with or without hospital/medical records
- (2) Hospital/medical records other than emergency room (e.g., discharge summary)
- (3) Emergency room records only (including associated X-rays or other lab reports)
- (4) Private physician, walk-in or emergency clinic

UNOFFICIAL RECORDS

- (5) Lay coroner report
- (6) E.M.S. personnel
- (7) Interviewee
- (8) Other source (specify): _____
- (9) Police

- (1) Certain
- (2) Probable
- (3) Possible
- (9) Unknown

- (1) Direct contact injury
- (2) Indirect contact injury
- (3) Noncontact injury
- (7) Injured, unknown source

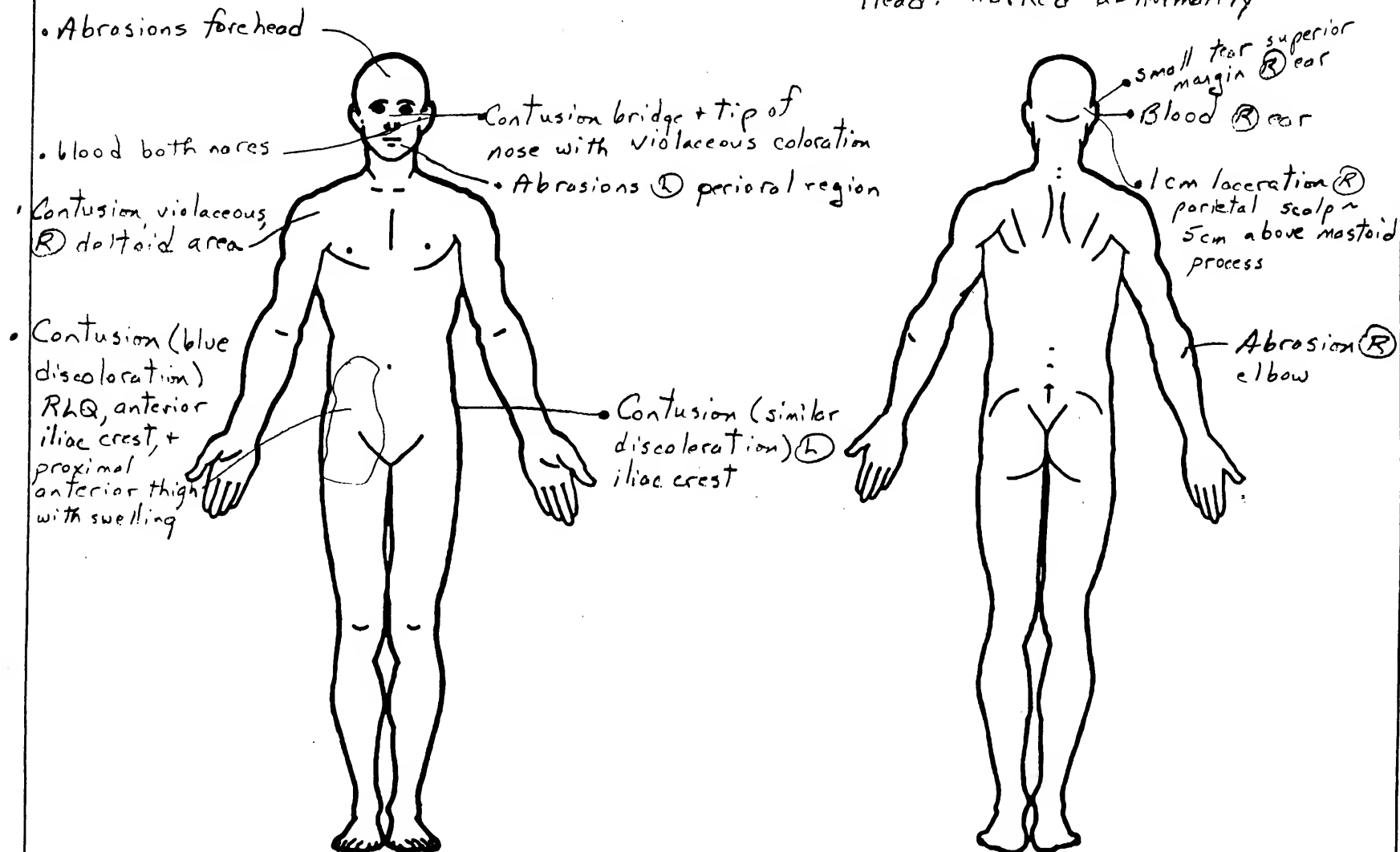
Height: 3'9" to 3'10" Weight: 35-40 pounds (A)

OFFICIAL INJURY DATA — SOFT TISSUE INJURIES

Autopsy

Indicate the Location, Specific Anatomic Structure, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)

Head: marked abnormality



OFFICIAL INJURY DATA — SKELETAL INJURIES

Restrained?

___ No

___ Yes

Blood Alcohol
Level (mg/dl)

BAL = ___

Glasgow Coma
Scale Score

GCSS = ___

Units of Blood
Given

Units = ___

Arterial Blood
Gases

pH = ___

PO₂ = ___PCO₂ = ___HCO₃ = ___

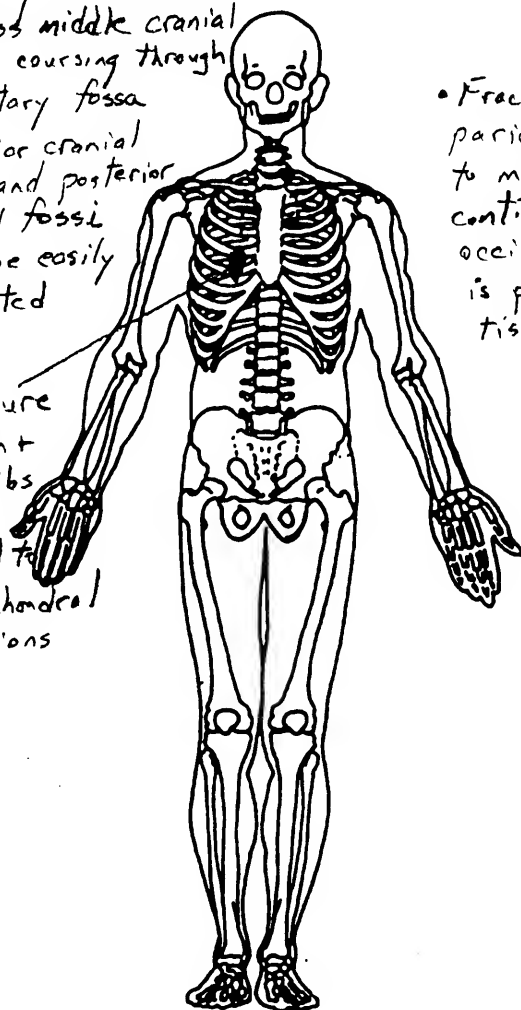
Autopsy

Indicate the Location, Specific Anatomic Structure, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)

Gaping fracture line
across middle cranial
fossa coursing through
pituitary fossa

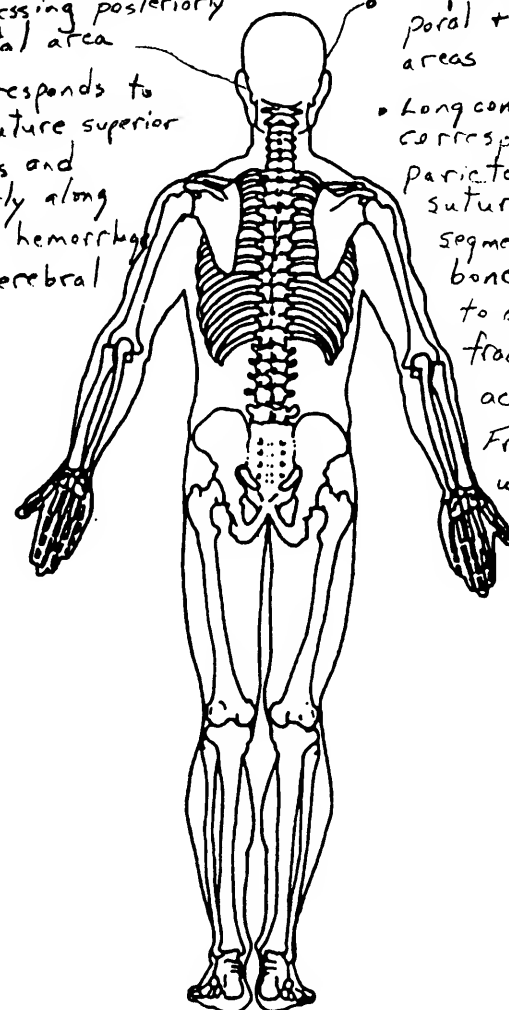
Anterior cranial
fossa and posterior
cranial fossi
can be easily
separated

• Fracture
④ 4th +
5th ribs
just
lateral to
costochondral
junctions



• Fracture adjacent to
② mastoid with fracture
line progressing posteriorly
into occipital area

• Fracture line corresponds to
parietotemporal suture superior
to mastoid process and
continues posteriorly along
occipital suture; hemorrhage
is present; no cerebral
tissue noted



Fracture, irregular,
step-like, ④ tem-
poral + ④ mastoid
areas

• Long complete fracture line
corresponding to,
parietotemporal
suture with freed
segment of temporal
bone slightly anterior
to auditory canal; a
fracture line continues
across frontal bone;
Fractures are gaping
with cerebral
cortical tissue
exuding

INJURY SOURCES

FRONT

- (001) Windshield
- (002) Mirror
- (003) Sunvisor
- (004) Steering wheel rim
- (005) Steering wheel hub/spoke
- (006) Steering wheel (combination of codes 004 and 005)
- (007) Steering column, transmission selector lever, other attachment
- (008) Cellular telephone or CB radio
- (009) Add on equipment (e.g., tape deck, air conditioner)
- (010) Left instrument panel and below
- (011) Center instrument panel and below
- (012) Right instrument panel and below
- (013) Glove compartment door
- (014) Knee bolster
- (015) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, mirror, or steering assembly (driver side only)
- (016) Windshield including one or more of the following: front header, A (A1/A2)-pillar, instrument panel, or mirror (passenger side only)
- (017) Windshield reinforced by exterior object (specify):

- (019) Other front object (specify):

LEFT SIDE

- (051) Left side interior surface, excluding hardware or armrests
- (052) Left side hardware or armrest
- (053) Left A (A1/A2)-pillar
- (054) Left B-pillar
- (055) Other left pillar (specify):
- (056) Left side window glass
- (057) Left side window frame
- (058) Left side window sill
- (059) Left side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
- (060) Other left side object (specify):

RIGHT SIDE

- (101) Right side interior surface, excluding hardware or armrests

- (102) Right side hardware or armrest
- (103) Right A (A1/A2)-pillar
- (104) Right B-pillar
- (105) Other right pillar (specify):
- (106) Right side window glass
- (107) Right side window frame
- (108) Right side window sill
- (109) Right side window glass including one or more of the following: frame, window sill, A (A1/A2)-pillar, B-pillar, or roof side rail.
- (110) Other right side object (specify):

INTERIOR

- (151) Seat, back support
- (152) Belt restraint webbing/buckle
- (153) Belt restraint B-pillar or door frame attachment point
- (154) Other restraint system component (specify):
- (155) Head restraint system
- (160) Other occupants (specify):
- (161) Interior loose objects
- (162) Child safety seat (specify):
- (163) Other interior object (specify):

AIR BAG

- (170) Air bag-driver side
- (171) Air bag-driver side and eyewear
- (172) Air bag-driver side and jewelry
- (173) Air bag-driver side and object held
- (174) Air bag-driver side and object in mouth
- (175) Air bag compartment cover-driver side
- (176) Air bag compartment cover-driver side and eyewear
- (177) Air bag compartment cover-driver side and jewelry
- (178) Air bag compartment cover-driver side and object held
- (179) Air bag compartment cover-driver side and object in mouth
- (180) Air bag-passenger side
- (181) Air bag-passenger side and eyewear
- (182) Air bag-passenger side and jewelry

- (183) Air bag-passenger side and object held
- (184) Air bag-passenger side and object in mouth
- (185) Air bag compartment cover-passenger side
- (186) Air bag compartment cover-passenger side and eyewear
- (187) Air bag compartment cover-passenger side and jewelry
- (188) Air bag compartment cover-passenger side and object held
- (189) Air bag compartment cover-passenger side and object in mouth
- (190) Other air bag (specify)
- (195) Other air bag compartment cover (specify)

ROOF

- (201) Front header
- (202) Rear header
- (203) Roof left side rail
- (204) Roof right side rail
- (205) Roof or convertible top
- (251) Floor (including toe pan)
- (252) Floor or console mounted transmission lever, including console
- (253) Parking brake handle
- (254) Foot controls including parking brake

REAR

- (301) Backlight (rear window)
- (302) Backlight storage rack, door, etc.
- (303) Other rear object (specify):

ADAPTIVE (ASSISTIVE) DRIVING EQUIPMENT

- (401) Hand controls for braking/acceleration
- (402) Steering control devices (attached to OEM steering wheel)
- (403) Steering knob attached to steering wheel
- (405) Replacement steering wheel (i.e., reduced diameter)
- (406) Joy stick steering controls
- (407) Wheelchair tie-downs
- (408) Modification to seat belts, (specify):
- (409) Additional or relocated switches, (specify):
- (410) Raised roof

- (411) Wall mounted head rest (used behind wheel chair)
- (412) Other adaptive device (specify):

EXTERIOR OF OCCUPANT'S VEHICLE

- (451) Hood
- (452) Outside hardware (e.g., outside mirror, antenna)
- (453) Other exterior surface or tires (specify):
- (454) Unknown exterior objects

EXTERIOR OF OTHER MOTOR VEHICLE

- (501) Front bumper
- (502) Hood edge
- (503) Other front of vehicle (specify):
- (504) Hood
- (505) Hood ornament
- (506) Windshield, roof rail, A-pillar
- (507) Side surface
- (508) Side mirrors
- (509) Other side protrusions (specify):
- (510) Rear surface
- (511) Undercarriage
- (512) Tires and wheels
- (513) Other exterior of other motor vehicle (specify):
- (514) Unknown exterior of other motor vehicle

OTHER VEHICLE OR OBJECT IN THE ENVIRONMENT

- (551) Ground
- (598) Other vehicle or object (specify):
- (599) Unknown vehicle or object

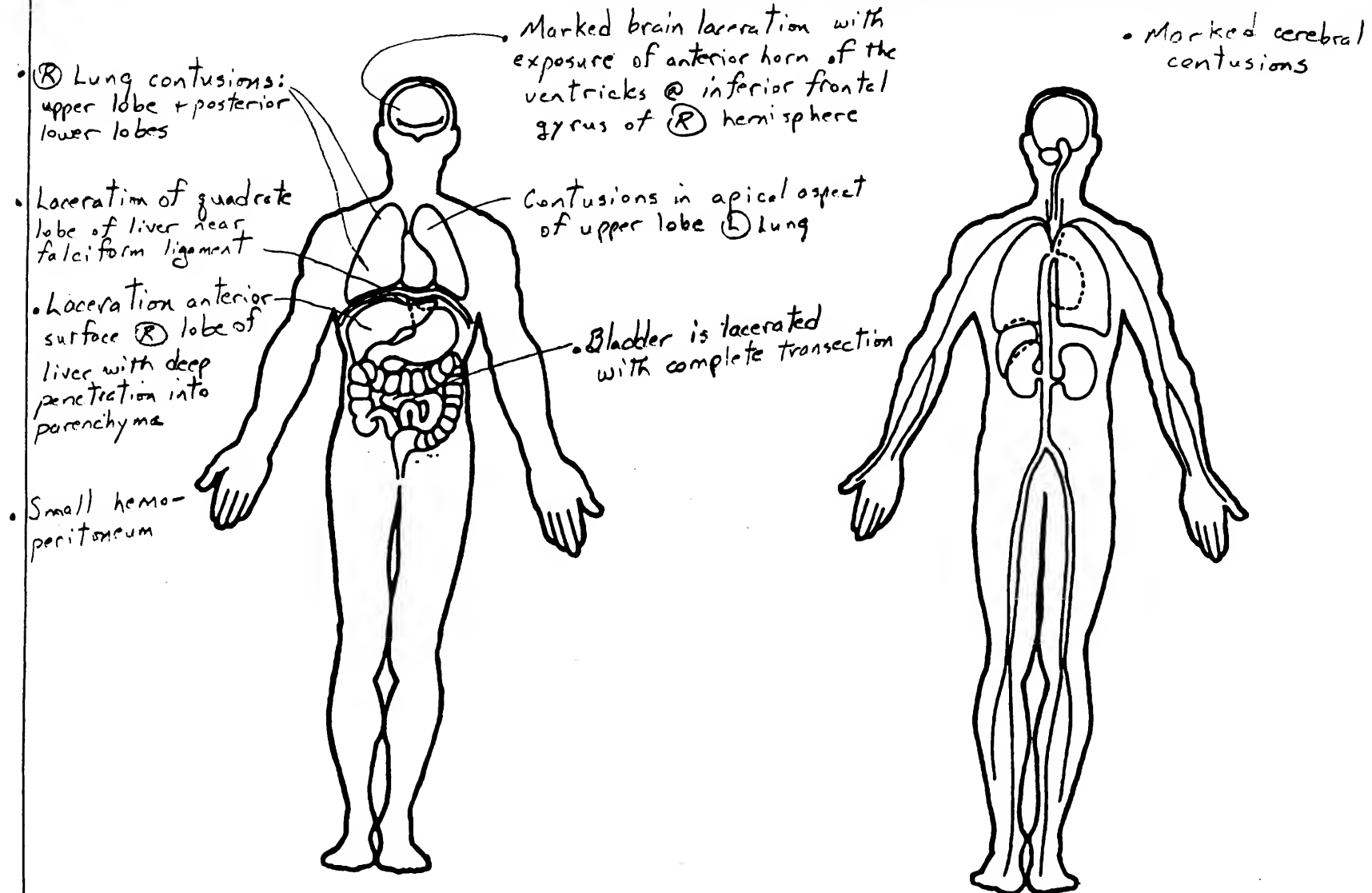
NONCONTACT INJURY

- (601) Fire in vehicle
- (602) Flying glass
- (603) Other noncontact injury source (specify):
- (604) Air bag exhaust gases
- (697) Injured, unknown source

OFFICIAL INJURY DATA —INTERNAL INJURIES

Autopsy

Indicate the Location, Specific Anatomic Structure, Detail (size, depth, fracture type, head injury clinical signs and neurological deficits), and Source of all injuries indicated by official sources (or from PAR or other unofficial sources if medical records and interviewee data are unavailable.)



CAUSE OF DEATH

BEST AVAILABLE

Skull Fracture (DC)

ICD-9-CM

OTHER DRUGS (GV16)

Specimen Test Type	Drug(s)	Drug Type
<input type="checkbox"/> Blood and urine tests <input type="checkbox"/> Blood test only <input type="checkbox"/> Urine test only <input type="checkbox"/> Other test <input type="checkbox"/> Unspecified		

MEDICAL RECORD ABBREVIATIONS

Symbol	Record Type Description
A	Autopsy—medical information based upon an invasive examination of a body
ME	Medical examiner's record—where the information reported on the patient is based on a non-invasive examination of the body
AR	Admission record/summary—any medical information on this record should be considered as post-ER since it summarizes the patient's admission; these records are common in short hospitalizations and usually only contain: admission DX(s), final DX(s), and a listing of surgical treatments; ICD-9-CM codes are frequently available.
FS	Admission/discharge face sheet—face sheets are essentially the same as admission record/summaries and contain the same types of information as discussed above
DS	Discharge summary—shorten history of a patient's hospitalization highlighting the patient's major injuries; this record is often written from the perspective of its author which in many cases is a consultant
OS	Operative record—summary of a performed surgical operation often providing detailed information about a specific trauma; patients who survive the surgery are normally admitted; thus, this record is normally considered post-ER; however, if this record results from an outpatient surgery, then treat it as emergency-room related
FX	Radiographic records—taken after the patient has been admitted, or while in surgery or intensive care
PN	Patient progress notes—supplemental record containing additional nurses notes taken after the patient's admission
HP	History and physical exam—medical history and the results of the physical exam obtained by the emergency room physician assigned to the patient upon arrival at the emergency room
CN	Consultation record—consultations are in essence additional history and physical exams performed by doctors whose expertise was requested by the emergency room physician; the consultation may occur during the emergency room visit or after admission
ER	Emergency room report—where the author of this information is undefined
EN	Emergency room nurse—"nurse/complaint of" section on the emergency room report
ED	Emergency room doctor—"objective/physical exam" section plus "diagnosis and treatment" sections (i.e., doctor portion of emergency room report)
NN	Nurse notes—supplemental record containing additional notes taken by the emergency room nurse(s)
EX	Radiographic records—taken during the patient's stay in the emergency room
CV	Coroner's verdict—statement of cause of death for legal specific regarding injuries; care must be exercised to ascertain the credentials of the verdict's author.
CR	Coroner's report—medical information based upon a noninvasive examination performed by a person who is not a doctor but who has the title of a coroner
ET	Emergency medical technician—report by a person who qualifies as an emergency medical services technician (EMS or EMT)
O	Other source—medical information based on an other source (e.g., newspaper, DVM—Doctor of Veterinary Medicine)

DC Death Certificate

AUTOPSY

CASE NUMBER IN 9522

MISSING AUTOPSY DATA